SKYWAYS

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Pilot's Report... the Mooney Mite

☆

"Watch the Weather" by Bill Odom

Low and Slow... via Heliop

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A page of service tips for private flyers and fixed-base operators

PLANE FAX

Check the weather—file a flight plan

Wise pilots take the guess-work out of cross-country flights by checking the latest weather reports before revving up. And they make sure others know where they're going, too. It's wise to play safe—to check the weather and file a flight plan with CAA Communications Center.

Cross-Country Tips

Inspect your plane before take-off

Be sure to make a pre-flight check before every cross-country . . . gas, oil, tires, battery, spark plugs leads, struts and control surfaces. Your Standard Airport Dealer will be glad to give your plane a complete going-over at the required intervals. He's had factory-trained experience to keep all parts of your aircraft in tip-top shape. So let him go to work for you. He'll take better care of your plane.

Figure your gas consumption—accurately

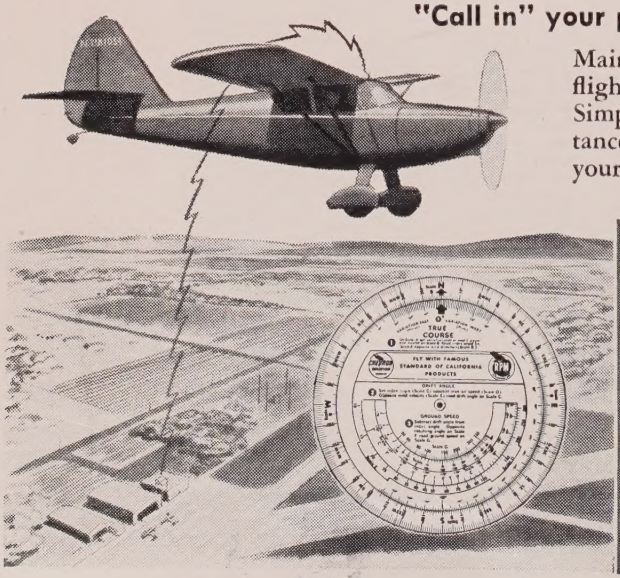
Good rule for computing fuel needs is: Enough gas to reach your destination and alternate airport, plus 45 minutes extra. And for maximum cruising range, use Chevron Aviation Gasoline. Ordinary fuels may contain too high a ratio of light fractions which can cause rapid consumption and an empty gas tank. But premium-quality Chevron Aviation Gasoline is scientifically blended for even consumption and fuel economy under all flight conditions. You'll get the most out of your plane—in flying hours and peak performance—with high-octane Chevron Aviation Gasoline.

Fuel supply rule-of-thumb

Have enough gas for destination
+
alternate field
+
45 minutes flying supply

"Call in" your position—keep air-ground contact

Maintain contact with Airways Communications Stations. Your flight calculator tells when you are approaching each check point. Simply turn the dial once for your answer to any time-and-distance problem. If you haven't picked up your free calculator from your Standard Airport Dealer, why not do it right away.



CHEVRON AVIATION GASOLINE

RPM AVIATION OIL

Standard Oil Company of California

Rancher...manufacturer...publisher prove

Bonanza travel pays

Sundays, Paul Harbaugh goes to church — 200 miles away! He and his wife fly their Bonanza to Oklahoma City from their busy Texas ranch in just over an hour. Weekdays he rounds up cattle by air and even picks up mail. When roads are snowbound, the Bonanza is often the only transportation moving.

Key men of Reuland Electric Company, Alhambra, California, can now cover all distributors and sales meetings and still keep up with home office work. Two company-owned 4-place Bonanzas double their productive time. Company gives outstanding service with Bonanza emergency deliveries of Reuland Electric Motors. Says Howard Reuland, "Our Bonanzas are paying investments."

A string of newspapers from Gadsden, Alabama, to Middletown, New York, takes lots of attention. Carmage Walls, president, General Newspapers, Inc., can do it with a Bonanza available for anytime mobility. "Doubles my capacity for work," he states.

Newspaper men find it ideal for spot news coverage. Amazing economy. Pennies-per-mile operating cost.

Apply Bonanza Transportation to your business

Company ownership of this fast, *quiet* plane turns travel days into travel *hours* — time saved you can put to *profitable* use. Investigate! A note on your company letterhead will bring an informative 60-page brochure on "The Air Fleet of American Business." Write today to Beech Aircraft Corp., Wichita, Kansas.

Top speed, 184 mph • Cruising speed, 170 mph • Range, 750 miles

Beechcraft

BONANZA

MODEL A35

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

Coming Up... in SKYWAYS

September is a month of news in the aviation world. It's the month of the famed National Air Races, held each year at Cleveland, Ohio. Air Race enthusiasts will be in Cleveland this year on September 3, 4 and 5.

SKYWAYS' September issue features:

● **"National Air Races . . . '49,"** *by Tony LeVier.* President of the Racing Pilots Association and himself a well-known pylon pusher, Tony LeVier gives us a preview of events this year at the National Air Races. In addition, Racer LeVier discloses changes that may be forthcoming in future air racing events, changes made necessary by the possibility of jet powered midget racers.

Don't miss Tony LeVier's article for your preview of races and air racing at the Nationals.

● **"Pilot's Report—New '49 Navion,"** *by Don Downie.* SKYWAYS' pilot-author takes a trip in a new model *Navion* and reports some interesting and effective changes and improvements in the operation and performance of the Ryan *Navion.*

● **"Get Plane Performance,"** *by Bill Odom.* The pilot who really knows and appreciates the importance of getting the best out of your airplane this month authors an article on just that. Getting top performance out of your airplane insures lower operation and upkeep costs. Bill Odom tells how to get this top performance in his September article.

● **"Using Your ADF,"** *by Ben Robin.* If you're thinking of installing ADF in your ship . . . or if there's a chance you'll get to fly someone else's plane that is equipped with it, read Robin's article and soak up some tips on the operation of Automatic Direction Finding equipment. Author Robin is a former airline pilot who has a record of 10 years and 6,000 hours of good flying. Ben also holds all CAA pilot ratings and in addition is a designated private and commercial Flight Examiner.

These are but a few of the many articles you'll want to read in SKYWAYS.

September Issue

SKYWAYS

Cover: Northrop X-4

Low & Slow . . . via Helioplane.....Al Hughes 14
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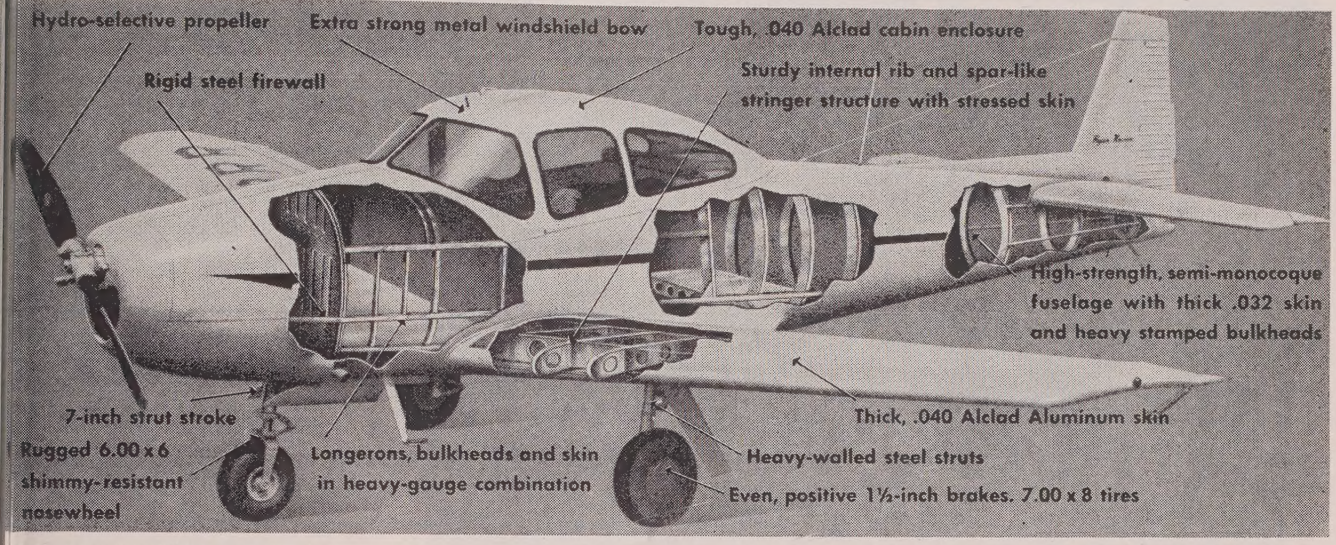
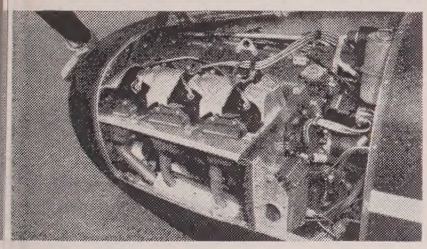
HERE'S WHY THE RUGGED, ALL-METAL RYAN NAVION GIVES YOU A GREATER MARGIN OF SAFETY!


Hydro-selective propeller
Extra strong metal windshield bow
Tough, .040 Alclad cabin enclosure
Rigid steel firewall
Sturdy internal rib and spar-like stringer structure with stressed skin
High-strength, semi-monocoque fuselage with thick .032 skin and heavy stamped bulkheads
7-inch strut stroke
Rugged 6.00 x 6 shimmy-resistant nosewheel
Longerons, bulkheads and skin in heavy-gauge combination
Thick, .040 Alclad Aluminum skin
Heavy-walled steel struts
Even, positive 1½-inch brakes. 7.00 x 8 tires

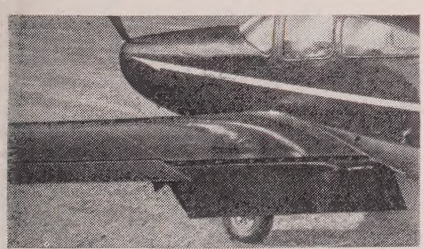
IT'S REALLY AS SIMPLE AS THIS: *Navion* is designed to be a safe, easy-to-fly plane. Within this fundamental premise, all other features are developed to the highest point *possible*. *Navion* is big and fast. It is rugged as a mule, and as hard-working. Aerodynamically and structurally it is designed, and is built, to take heavy-duty punishment. But, above all, the *Ryan Navion* is safe... and it is easy to fly. That's why it's first choice with non-professionals who fly for fun and profit. And, here's what makes it that way...



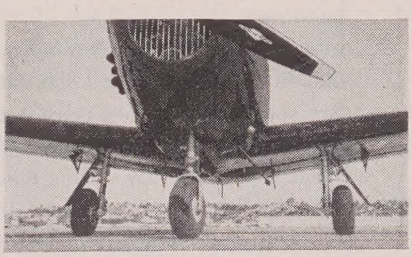
HUSKY, 205 h.p. engine features dual fuel system for dependability... delivers up to 155 m.p.h. cruising. Fully loaded, initial rate of climb is 900 ft. per minute.

SELECTIVE SETTING, high-lift flaps enable *Navion* to land at only 54 m.p.h. Only 875 ft. needed to clear a 50-ft. obstacle, either on take-off or landing... fully loaded, no wind.

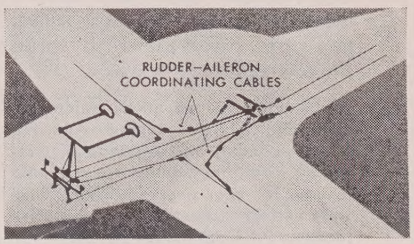
NAVION GIVES YOU new VHF radio transmitter. Standard instruments now include manifold pressure, dampened fuel, outside temperature gauges, rate of climb indicator.



HERE'S THE FAMOUS *Navion* wing with its anti-stall design. For extra safety, full aileron control is yours even *below* stalling speed. Note full (43°) flap deflection.



THESE HEAVYWEIGHTS will take a beating! Big, steerable nosewheel is heavier than most "main" gears. Oversize tires; deep-stroke shocks for safe, easy rough-field landings.



EXCLUSIVE rudder-aileron control linkage makes *Navion* so easy to fly. You get "two-control" after take-off, yet you have rudder when you want it. Write for FREE booklet.

Ryan Navion

NO OTHER PLANE COMBINES SO MANY FEATURES SO WELL

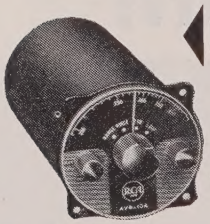
THESE COMFORT FEATURES ARE STANDARD EQUIPMENT

- "All-Round" Sound Insulation and Muffler
- Soft-Cushioned 43-in. Rear Seat
- Front Seats Adjust Individually
- New Heating-Ventilating System
- Limousine-Type Center Arm Rest
- In-Flight Access to Luggage
- Easy-Entrance Roll-Back Canopy

Rely on Ryan **RYAN AERONAUTICAL COMPANY, 208 LINDBERGH FIELD, SAN DIEGO 12, CALIFORNIA**

NEW LOW PRICES

on RCA's popular Personal Plane Radio for instrument-hole mounting

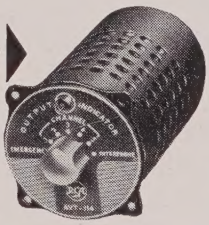


NOW...only $40*

Range Receiver, Model AVR-104

The ideal low-frequency receiver for personal planes. Receives four-course ranges and airport towers. Operates from transmitter power supply, separate power supply, or battery pack.

NOW...only $149.50*



VHF Transmitter, Model AVT-114

The extra power of this compact 6-watt vhf transmitter will bring a quick reply from the tower. Complete with interfone, output indicator, whip antenna, and power supply.

Order from your RCA Aviation radio dealer today

*Suggested list price. Prices apply only within continental U.S.A.

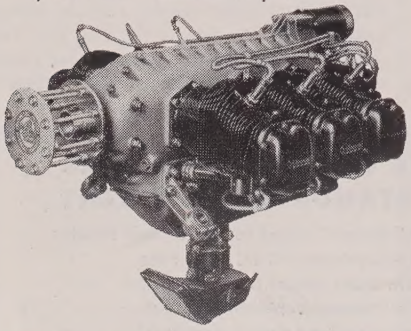
AVIATION SECTION
RADIO CORPORATION of AMERICA
ENGINEERING PRODUCTS DEPARTMENT, CAMDEN, N.J.
In Canada: RCA VICTOR Company Limited, Montreal

3 TIMES 'ROUND THE GLOBE

NON-STOP!

It was a stock Continental C145 which kept Bill Barris and Dick Riedel in the air in their Aeronca for ***six full weeks*** — a new mark. They flew 75,000 miles, non-stop, equivalent to three times around the world.

Engine stamina played a major role in setting this new record. And the safety, economy and dependability resulting from that stamina are available to you, for your everyday flight, in a wide variety of personal and executive planes with Continental power.



Continental Motors Corporation

Aircraft Engine Division
Muskegon, Michigan

AIR YOUR VIEWS

Nene or J-35

Gentlemen:

In your March issue, in the article "Captivair Class," there is a picture of a class of Air Force cadets looking at a cutaway model of a jet engine. The caption states the engine is the same type that powers the F-80. I was under the impression that the F-80 used an Allison J-35, while I'm quite certain the engine in the picture is an English model called Rolls-Royce *Nene.*

G. L. ROLFE

Wickliffe, Ohio

The engine in question is actually a G.E. I-40. The Allison Model 400 (USAF J-33-23) jet engine is a development of that General Electric I-40. Today's F-80's are powered by the J-33. The J-35 powers the Martin XF-48, the North American XB-45, the Northrop YB-49, the Republic F-84, the Consolidated XB-46 and the Douglas D-558-1 Skystreak. *The* Nene *powers the* Panther, *as you stated, but it is not the jet engine shown in the picture.*—ED.

Open Cockpit Pilot

Gentlemen:

The Ryan Company no doubt has a wonderful plane in the *Navion,* but why couldn't or shouldn't they resume production of the Ryan S.T.? Personally, I prefer a low-wing open-cockpit job, but to my knowledge there aren't any in production.

Greetings, Airmen!

There are still free copies of the next issue of SKYWAYS for those 300 readers who reply promptly to the questionnaire below. You are the ones we want to please . . . and the more we know about you and your wishes the better we can do our job for you and other airmen and air travelers.

QUIZ BIZ

What articles did you like best in the August issue? On the lines to the right of the titles, grade each article: 1—Swell; 2—So-So; 3—Not interested; and 4—No like!

Low & Slow via Helioplane ——
Used Planes, Bid, Asked ——
Watch the Weather ——
Pilot's Report: Mite ——
Tricycle-Gear Cub ——
ACC Air Show ——
Aero Bird Dog ——
Lockheed F-90 ——
Operation JATO ——
Getting Off on Floats ——

What type of plane do you prefer on SKYWAYS' covers? Military.....; Personal Plane.....; No Preference..... In our Pilot's Reports, what interests you most, Plane Styling.....; Performance.....; Engineering details.....; Uses.....; or what.....?

As a hobby, do you build model planes?.....How long have you been building model aircraft?.....How much do you expect to spend this year on building model planes?.....Would you like SKYWAYS to include plans for and articles on model planes?.....

Are you interested in picture-stories of airline operations?.....

Do you ever use the airlines? Domestic?.....; Intern'tl?.....

What is your average airline mileage per year?.....

What airline do you use most frequently?.....

Between what cities or sections of country do you travel-by-airline most?

.....

Are your airline trips for business?..... Pleasure?..... Both?.....

Have you made any over-seas airline trips?..... To what country?

.....

Just a bit about you, but not too personal:

Name:..... Address:.....

Pilot's License: Student..... Private..... Commercial..... ATR..... A&E.....

Age: Under 21.....; 21 to 30.....; 31 to 40.....; 41 to 50.....; over 50.....

Occupation:..... What plane do you own?.....

Do you use it for business?..... Pleasure..... Both.....

Fill out and mail to: Research Dept., SKYWAYS
444 Madison Avenue, New York 22, New York.

Can you give me any data on the old
n S.T.?

R. E. BOYD

ton, Ohio

*Ryan did indeed have a swell plane in the metal-
plaged S.T. It was a favorite of your editor's,
However, present market demands call for
Navion-type family airplane, and so aircraft
panies are tooled to produce that type of ship.
ere aren't any open-cockpit jobs being made
ay that we know of, except perhaps such a
ne as the Knight Twister. Plans, etc., are sold
it and then the buyer builds it himself, but it
ot an N'd airplane. It is strictly a "restricted"
plane in the experimental category . . . and is
ingle-seater aerobatic-type ship. Another one
the Pitts Special, but it is not a production
plane either.*

*The Ryan ST's were built from 1935 to 1942.
the early years of its production, the ST planes
re one or two-place all-metal ships, some of
ich were powered by 125-hp Menasco engines,
ers by 150's and 160-hp Kinners. The first
p-wing monoplane trainer to satisfy Army re-
rements, the ST's became the PT-16, 20, 21
22. Powered by 160-hp Kinner, the ST-3
T-22) cruised at 123 mph and had a range of
2 miles. The earlier (1937, 38 and 39) ST-A
ecial, powered by 150-hp Menasco, cruised at
0 mph.*—ED.

on-Stop Record

ntlemen:

In your May, 1949, issue an advertisement
ted that the Lockheed P2V *Neptune* had flown
greatest distance non-stop, farther than any
er plane. What about the B-50 that recently
w around the world non-stop?

S. D. LOULA

icago, Illinois

*At the time that advertisement was prepared,
B-50 had not accomplished its round-the-
rld mission. Credit is due both those airplanes
. and both of them are examples of American
sign and production talent.*—ED.

anted: Amphib

ntlemen:

What has happened to the Commonwealth
mmer? From all advanced reports it looked
the answer to a sportsman's dream. Up here
the hills of ole Kaintuck we take our flying
ious and operate off small fields. There are a
of fishermen here, too, all busy men with
ited time. A small amphib would make it
ssible for us to get in a lot of extra hours at
favorite sport, with the TVA lakes just a few
inutes flying time away, but several hours by
nding road. What good is a floatplane when
ur local airport is a strip? And what good is a
ndplane when the nearest landing strip to good
hing and hunting is several miles by bus or taxi?

DR. ROBT. MARKS

arlan, Ky.

*We get your point, Dr. Marks, and might add
at there are many flyers who share your desire
a good amphib for hunting and fishing trips.
he Commonwealth Company went out of busi-
ss a few years ago . . . and with it went the
mmer amphib. Goodyear built a nice amphib,
t it has never gone into production and no one
ows whether or not it ever will. That decision
nges on the aircraft market conditions. About
r only suggestion at the present is . . . a
epublic Seabee. A few are available on the
ed-plane market. We know of several hunting
d fishing enthusiasts who fly the Seabee and
e it for the job it does for them. Spare parts,
c., continue to be available and so there's little
ance of your ending up with a plane that's
phaned. Perhaps in another year or so there will
a new amphib on the market . . . one is being
perimented with now, but we can't say anything
ore about it for the present.*—ED.

-76

ntlemen:

Could you tell me just what a C-76 is?

CHARLES COBB

ve, N. Y.

*It was an all-wood two-engined transport built
ring the war by Curtiss-Wright. Twenty-five
re built for the Air Corps; rest of the order
ncelled. This ship never did go into produc-
n for civil market.*—ED.

ONLY THE BEST CAN BE AVIATION CADETS

...and You Live the Best Kind of Life a Young American Can Live

This is the life! Red-blooded living that takes the best that's in you—and gives you back the pride of measuring up to a man-sized job.

You fly the skyways in the world's finest aircraft. Sports and exercise keep you "in the pink." You meet the challenge of military life—and know its dignity, its color. And when it's time to relax, there are parties, dances, and receptions.

Add to that a $35,000 pilot-executive training course you couldn't equal anywhere else—food, pay, clothing and housing—and you have the greatest, most worthwhile year of your life . . . the year you are an Aviation Cadet!

OVER $4,000 A YEAR

Graduation brings the reward that only the best can earn—your Air Force wings and officer's bars—and a starting salary of over $4,000 a year. You may be one of the leaders of your Cadet class who receive Regular commissions. If you are one of the select few who can qualify for the adventurous life of an Air Force pilot and officer—inquire about Aviation Cadet training NOW!

DON'T WAIT!

Investigate TODAY! Both single and married men are now eligible. Apply at your local Recruiting Office or at any U. S. Air Force Base. Or write

Chief of Staff, U. S. Air Force,
Attention: Aviation Cadet Branch,
Washington 25, D. C.

WIN YOUR WINGS

U. S. AIR FORCE

For men with at least two years of college (or who can pass an equivalent examination). Between ages of 20 and 26½. High physical and moral qualifications.

U. S. ARMY AND U. S. AIR FORCE RECRUITING SERVICE

USAF NEWS

A FIVE-PART training program designed to provide training for more than 135,000 USAF Reservists and to offer inactive and active duty training pay for 75,000 of that number began last month.

The training plan was drawn up in accordance with the President's directive "to make fullest possible use of the Regular Establishment in the training of Reserves."

Reservists will be trained at 70 regular Air Force bases throughout the United States, as well as at 23 other locations designated as Air Force Reserve Training Centers. Two of these, Floyd Bennett Naval Air Station, New York, and the Portland, Oregon, municipal airport, will be activated as AFRTC's. Eighteen present AFRTC's will be discontinued due to the readjustment necessary.

Operating staff of AFRTC's will include reserve officers and airmen on extended active duty for three years, assigned to the 25 tactical wings at the 23 AFRTC locations which will train active duty (short-term) personnel and inactive-duty personnel.

The five-part program includes: the Mobilization Assignment Training Program, the AFRTC program, the Corollary Unit program, the Volunteer Training Unit program, and the Extension Course program. Reservists will receive pay for training in all but the last two. Reserve airmen will not be given Mobilization Assignments at the present time, however, but reserve officers may receive such assignments.

Mobilization assignments are those the reservists will fill on M-day, allowing regular USAF units, which train the reservists, to expand rapidly to "wartime" strength from "peacetime" strength. Mobilization assignment training will consist of not more than 48 periods of "on the job" training, plus two weeks of active duty with the M-day unit, each year.

The AFRTC program will allow four reserve combat squadrons plus headquarters to train on the equipment of one squadron of the training wing. This four-for-one system will allow the maximum possible utilization of available equipment. The AFRTC program will be under direct charge of the Continental Air Command, Mitchel AFB, New York. Twenty-five wings will be used in the program, made up of five Light Bomb Wings (80 B-26's), three Troop Carrier Wings (48 C-47's) and 17 Troop Carrier Wings (272 C-46's). In addition, reservists will train with 267 T-6's, 136 T-7's, and 343 T-11's.

ConAc will initially organize 320 corollary units of more than 29,000 officers and men, which will then be transferred to the major air commands for training. This type of unit is designed for "prompt" mobilization, and uses equipment of regular Air Force units.

THE FUNCTIONS of USAF's Pacific Air Command were assumed by the Military Air Transport Service on 1 June.

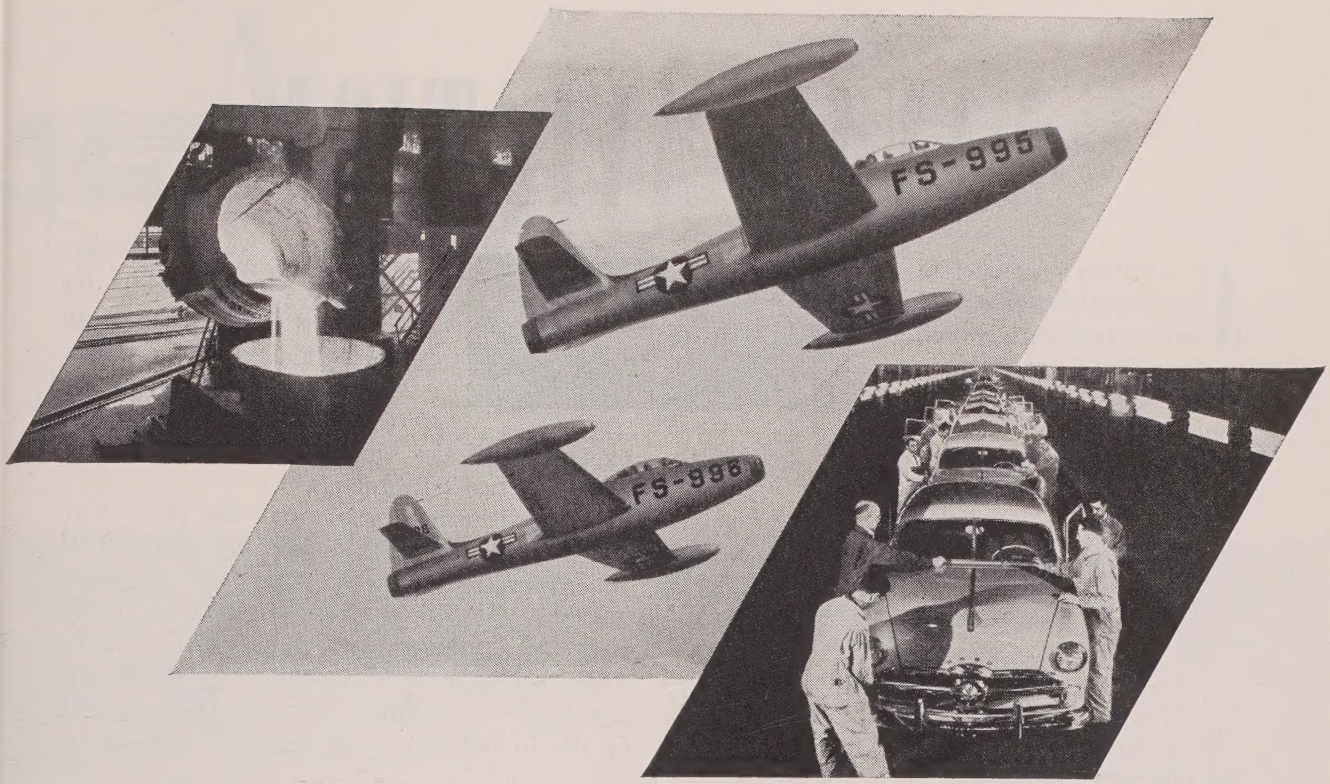
Brigadier General Harold Q. Huglin, formerly commander of Fairfield-Suisun AFB in California, was reassigned as Deputy Commander of the Pacific Division, MATS, as Wing Commander of the newly organized 1500th Air Transport Wing, and as Air Force representative on the staff of the Commander-in-Chief, Pacific Command at Hickam AFB, Hawaii.

LUBBOCK AFB, Texas, is being reactivated to take the advanced twin-engine school of the Air Training Command, which will move there in November from Barksdale AFB, Shreveport.

THE AIR Materiel Command has grounded all H-5 helicopter aircraft, used chiefly in air-rescue work, until the main rotor link area can be tested. A fatal accident was the cause of the grounding. Aircraft are to be released for flight after the affected area has been tested, if no evidence is found of parts failure.

THE XF-90, newest of the Air Force jet fighters, has completed taxi tests at Lockheed's Burbank, California, plant. Designed as a penetration fighter, its mission will be to operate deep within enemy territory against aircraft and ground targets.

Powered by two turbo-jet engines, the plane has 35 degrees of wing sweep-back, a span of 40 feet, length of 55 feet and height of 15 feet. It has conventional landing gear, a pilot-ejection seat, cabin pressurization, air conditioning.



THUNDERJETS OVER AMERICA

Detroit's production lines of automotive miracles that contribute to logistic leadership . . . men and women who enjoy their daily operation . . . with the highest standards on earth.

¶ Raw materials in prodigious quantity for machine and mechanic alike, from the roaring hearth of Pittsburgh and the cattle pens of Chicago.

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NAVAL AVIATION

All aviation personnel in the Naval Reserve, and other reservists whose postwar experience or training qualifies them for assignment to aviation activities, are eligible to participate in the Naval Reserve Aviation program.

Naval reservists who take part in the program in cities and towns throughout the country usually received group instruction and flight training during off-work hours on week-ends.

The program has no set personnel quotas. A few "weekend warriors" can establish a Volunteer Aviation Unit (VAU) within any of the nine continental Naval Districts by applying to the District Commandant. Each unit directs and encourages maintenance and development of aviation skills, and training of its members through group instruction, lectures, films, and self-study.

At present, 102 VAU's are established. Their membership includes 3,060 officers and approximately 8,000 enlisted personnel.

Earning their nickname as the *Cherry Point Aerial Truck Drivers,* the Second Marine Air Wing transport squadrons did a weighty job during the Atlantic Fleet Command war maneuvers, carrying a total of 12,551 persons, 1,500,000 pounds of equipment and supplies, and flying 5,239,797 passenger miles during a two-month period. The R5D *Skymasters,* R5C *Commandos,* and R4D *Skytrains* took off with a full load on each of the 1,612 flights made during the maneuvers.

The Marine Corps is acquiring eight Fairchild transport cargo planes, known as "Flying Boxcars," which after evaluation tests will be sent to Cherry Point. Designated by the Navy as the R4Q-1, the plane is a development of the C-82 *Packet.* Noticeable changes are elimination of the lower stabilizer and installation of double-wheeled landing gears mounted with 14-ply tires. The R4Q features greater pilot visibility, larger powerplants, and greater load capacity.

Additional horsepower supplied by two Pratt and Whitney 28-cylinder *Wasp Major* engines gives the Fairchild R4Q-1 an increased rate of climb and increased speed with a greater load. The new transport plane can carry a nine-ton payload a distance of 2,000 miles.

The Navy's D-558 II *Skyrocket* flew recently for the first time using both rocket and jet-engine power simultaneously, at Muroc test base. The needle-nosed plane got off the sand runways in 2400 feet using the two powerplants.

After exhausting rocket fuel, the plane flew on its jet engine for another 19 minutes and landed with that power. During the past year the *Skyrocket,* built by Douglas, has made numerous routine research flights on jet power alone. With the development of its rocket engine by Reaction Motors Inc., the D-558 II will be able to gather new data on high-speed flight.

Value of the pinwheel method of air travel has again been emphasized by a new Navy order for seven twin-rotor Piasecki helicopters, the XHJP-1 model which presently holds the world unofficial speed record of 131 mph. The Piasecki also holds, by accident, another distinction—that of being successfully looped.

The loop was performed by test pilot Jim Ryan, while putting the new Piasecki through dive tests; with the ship in a vertical position, nose up, Jim decided he didn't like a stall, and the only other way out was to go on around.

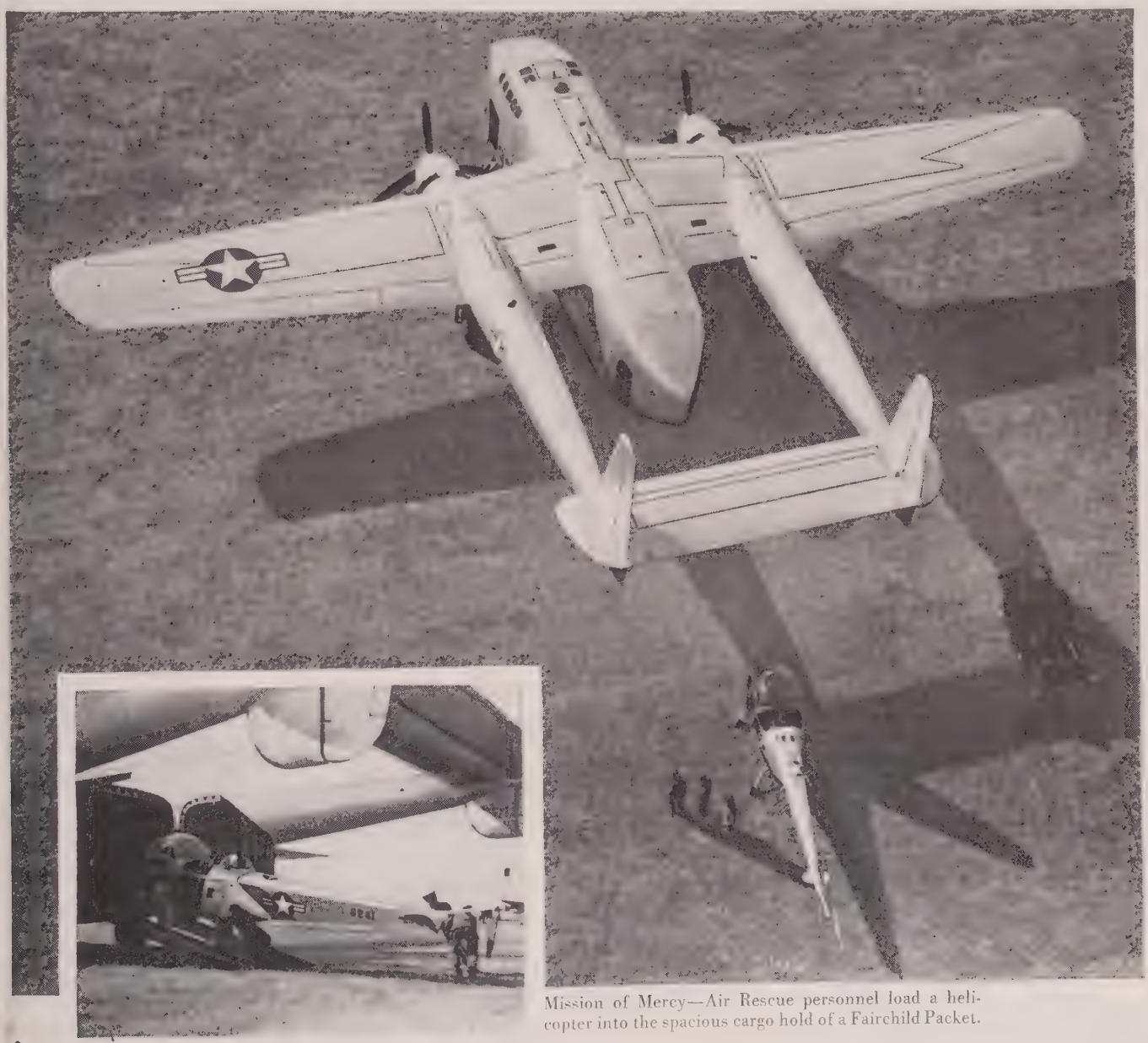
Outstanding feature of the XHJP-1, smaller sister to the HRP-1, is folding rotor blades, permitting stowage on small navy escort carriers. Its twin rotors have a seven-foot vertical clearance, offering a safety feature for ground crews.

Integration of the former Naval Air Transport Service into the Military Air Transport Service of the U. S. Air Force is covered in the third quarterly report of MATS. During the first three months of 1949, the report indicates that Air Force and Navy unification has proceeded satisfactorily along the lines specified by directives.

The Navy contributed training and operating assistance in meeting heavy commitments in the Berlin Airlift. The Navy also made available additional flight and maintenance personnel, beyond agreed obligations, to permit increased performance by MATS Navy Squadron VR-3 in trans-Atlantic support, and of VR-6 and VR-8 in the Airlift Task Force. The last two squadrons were noted for outranking all other airlift units in efficiency of operation.

AIR RESCUE

Over faraway jungles, deserts and mountains, helicopters of the USAF Air Rescue Service have flown in search of stranded airmen and passengers. The helicopters got there because they have been given a "mother" ship—the Fairchild Packet—that transports them over distances far beyond their range. Thus, our Air Force has added a new ability to the versatile Fairchild Packet—increasing the importance of its part in the development of modern airborne military tactics.



Mission of Mercy—Air Rescue personnel load a helicopter into the spacious cargo hold of a Fairchild Packet.

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PROP WASH

Aero Oddities

Cow in a Corn Field. Farmer living near airport lost a cow in his corn field. Foliage was so thick and corn so high it was impossible to spot the ambling bovine. Farmer went across road to airport, rented plane, flew it over his field, located missing milker and in few minutes had it back in pasture. *(C. Lyons, Jr., DeKalb, Illinois)*

TV-Navigation. Flying lightplane from Philadelphia to Flushing, N. Y., pilot ran into bad weather, had no radio, found himself lost with ceiling getting lower and lower. Finally spotting TV antennas on tops of houses, pilot remembered all antennas in New York City faced toward transmitter stations. Lost airman lined himself up with antennas, soon discovered where he was, slipped into Flushing Airport just under weather. *(J. Brodsky, Brooklyn, N. Y.)*

Bites Hand that Feeds. During radio-controlled aircraft tests, a fighter plane was mothering a remotely controlled B-17 to an imaginary target. Another fighter plane, representing the enemy and also equipped with radio-control equipment, gained radio control of B-17 by emitting stronger signal than first fighter. "Mother" fighter plane ended up being chased home by its own B-17. *(Ed McNamara, Detroit.)*

Ill Wind. At Minot, North Dakota airport, an F-51 *Mustang* came into field, taxied to spot near airline DC-3. Fighter-plane pilot gunned his engine, prop blast tore both elevators off the DC-3. *(Gerry Murphy, Granville, N. Dakota)*

Long Way Home. Woman employee of trans-Atlantic airline vacationed in Paris from home in Ireland. Enroute back to Shannon by plane, woman learned weather forced airliner to skip stop at Shannon, fly direct to New Foundland. Back from New Foundland to Ireland on next plane, Shannon was again skipped and employee landed again in Paris. She made it on third try after unplanned round trip across Atlantic. *(Bill Dixon, Kansas City, Missouri)*

Windmill. In fighting oil well blaze recently, Shell Oil Company mounted two training planes, stripped of wings, on north side of blaze to keep fire from changing direction. While fire-fighters fought blaze from north side and in a north wind, trainers were kept ready for engine run in case wind changed direction, endangering firemen's lives. *(E. E. Gentry, Marthaville, La.)*

Wrong Cue. While flying as a passenger in a DH *Tiger Moth* over the river Avon in England, man heard pilot say, "Look at the bolts coming out of the aileron!" Passenger leaned out of cockpit as far as he could and stared in horror. A lifetime later, when pilot brought ship to safe landing at airport, man gasped out weakly he was glad he'd gotten back before ailerons came off. When pilot heard this, he nearly fell out of his seat exclaiming, "Bolts, be d . . . . d, I said, 'Look at the boats coming out of the Avon!'" *(L. Andrews, Hamilton, Ontario, Canada)*

Att'n Readers:

If you have any news note oddities pertaining to aviation, send them to SKYWAYS, Box 17, 444 Madison Avenue, New York 22, N. Y. Five dollars will be paid the sender of each "oddity" printed. Contributions cannot be returned unless accompanied by stamped addressed envelope. The decision of the editors is final.

GOOD MONEY

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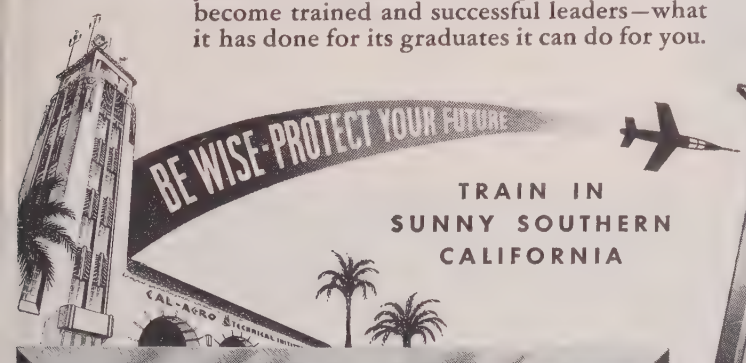

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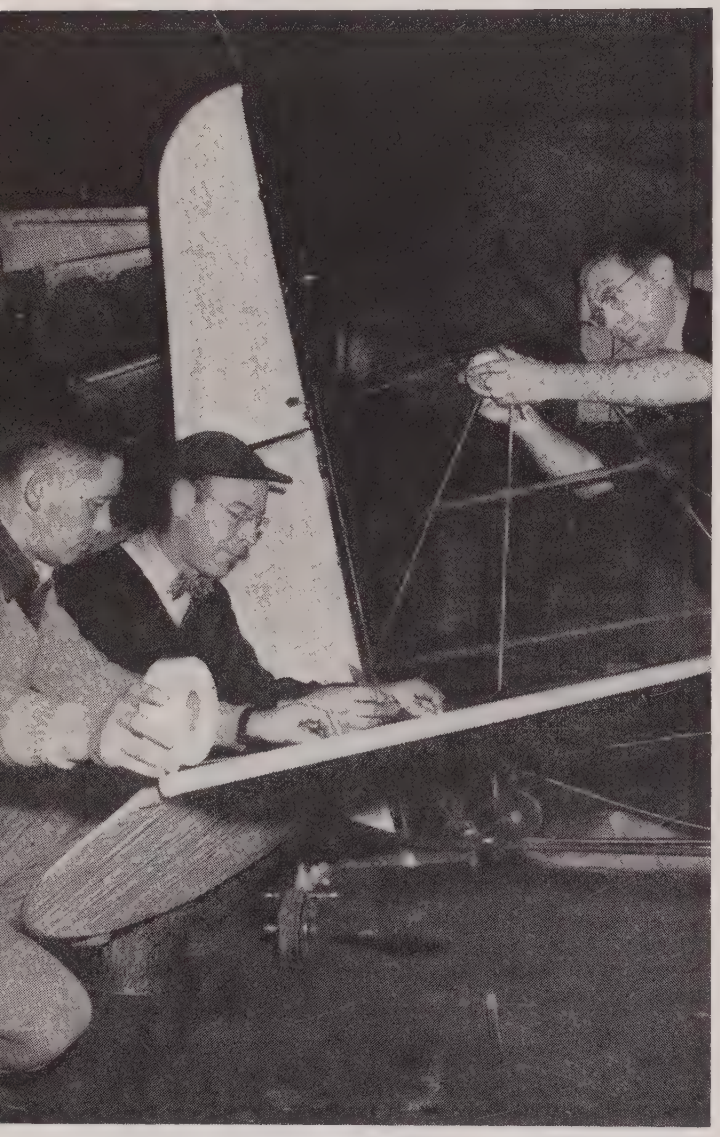
S-8

Low and Slow via Helioplane

By ALBERT D. HUGHES

Aviation Editor, Christian Science Monitor



A REVOLUTIONARY performing highly safe personal airplane with a "jack rabbit" take-off but with approach stability well below the stalling speed of all present day light aircraft has made successful flights at the E. W. Wiggins Airways base at the Norwood, Mass., airport.

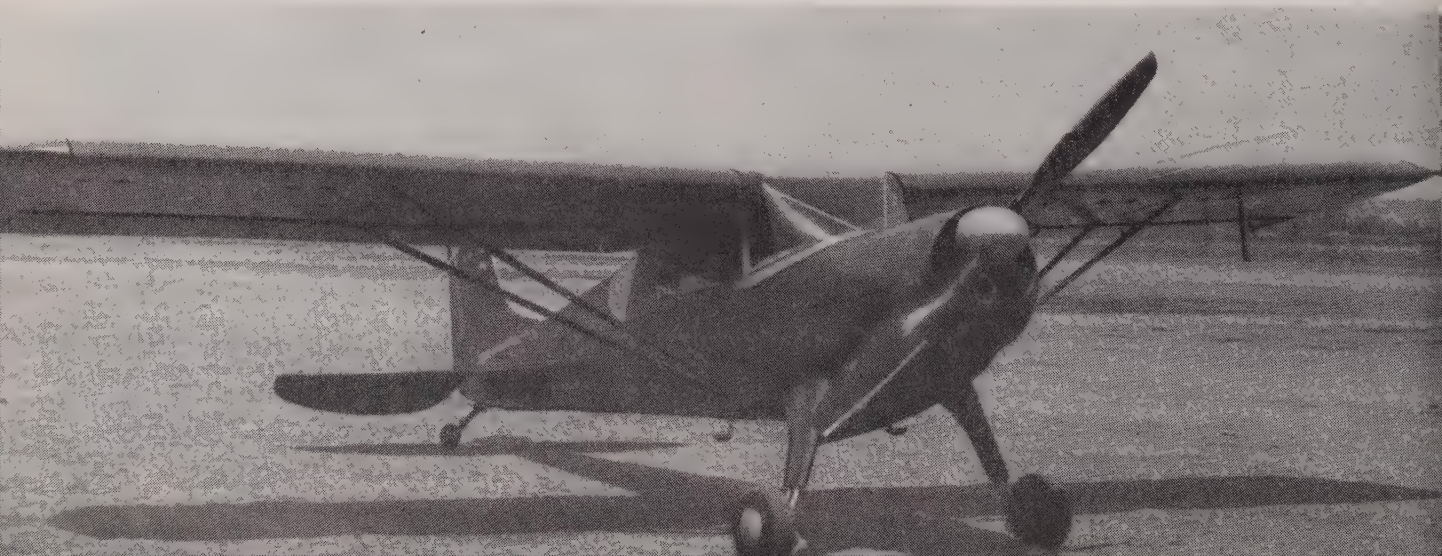
Its designers, Otto C. Koppen, Professor of Aeronautical Engineering at Massachusetts Institute of Technology, and Dr. Lynn L. Bollinger, Associate Professor of Business Administration at Harvard Business School, believe their aircraft design effectively deals with the most important performance shortcomings of conventional personal planes—shortcomings which they believe have impaired the substantial growth of private aviation.

Koppen and Bollinger call their aircraft a "*Helioplane*" because it combines desirable characteristics of both fixed- and rotary-wing craft. The two professors have, in fact, for business purposes incorporated the Helio Corporation to promote their design. Public announcement of their plane was made on May 16.

Essentially speaking, however, the pioneer model of the *Helioplane* in all respects is a fairly conventional appearing two-place, high-wing monoplane with an 85-horsepower Continental engine but incorporating several highly unusual designs and patents of Professor Koppen.

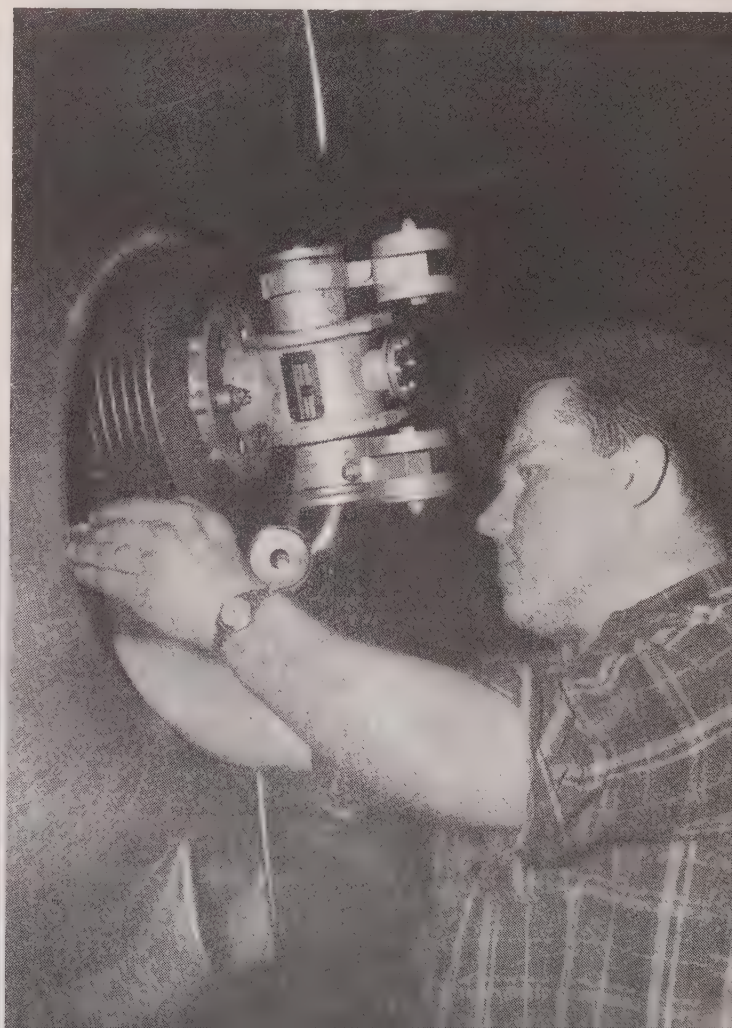
WORKMEN at Norwood base *(above)* of Wiggins Airways work on Koppen-Bollinger plane. Note plane's split rudder

LANDING GEAR on *Helioplane (below)* is CAA-sponsored swivel type that permits the plane to land cross wind



FLAPS that seem over-sized for a lightplane enable K-B ship to take off at sharp angle when flaps are full down

NOSE PHOTO of the *Helioplane (right)* shows details of the belt drive that gears down the prop for quieter operation



The *Helioplane*, according to Professor Koppen as well as Professor Bollinger, is designed to meet the following specifications:

Take off in less than 100 feet in still air with a full gross load. This is about one-fifth of the take-off run of the nearest comparable lightplane.

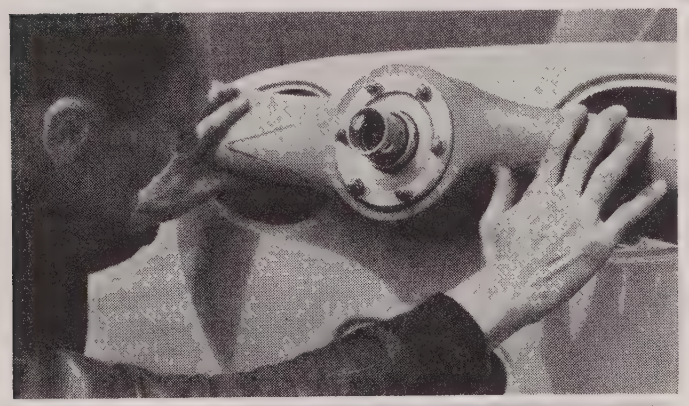
Take off and clear a *(Continued on page 43)*

WING SLOT details can be seen here as workmen *(below)* complete linkage of controls on the Koppen-Bollinger plane

Used Planes

Bid, Raked and Sold

By JERRY LEICHTER



BUYER of used plane should have ship thoroughly checked before he makes final deal

LICENSED A&E should be called in to go over engine for possible corrosion if airplane has had little flight time

THE used-airplane business has become a vital factor in the success or failure of the personal-aviation industry, according to the manufacturers themselves. Unfortunately, it is being twisted with misconceptions similar to those that have afflicted the new-plane field. What is the proper place for used aircraft in the sales picture? Are present used-plane prices logical? How does the buyer decide whether he's getting a break or a bust? These are some of the important questions that are affecting personal aviation.

The market place for both new and used air-

MECHANIC should inspect plane to make sure CAA directives, manufacturer's bulletins have been complied with

craft has been and continues to be a puzzle to practically everyone connected with the personal-aircraft industry. Buyers are sure that prices are too high, sellers are sure that they are too low, the manufacturers have to sell enough new planes in a constricted market to at least take care of their costs, and service operators need more volume before they can reduce maintenance costs.

The progress of per- *(Continued on page 48)*

Editor's Note:—Average market selling price is determined from sales price after bargaining between seller and buyer; owner asking price is average of values placed on aircraft before bargaining; buyer price is based on offered price before bargaining. Condition and previous care affect price more than equipment installed. Radio equipment and type of prop do affect price. The prices listed below are not to be construed as final; they are merely "averages."

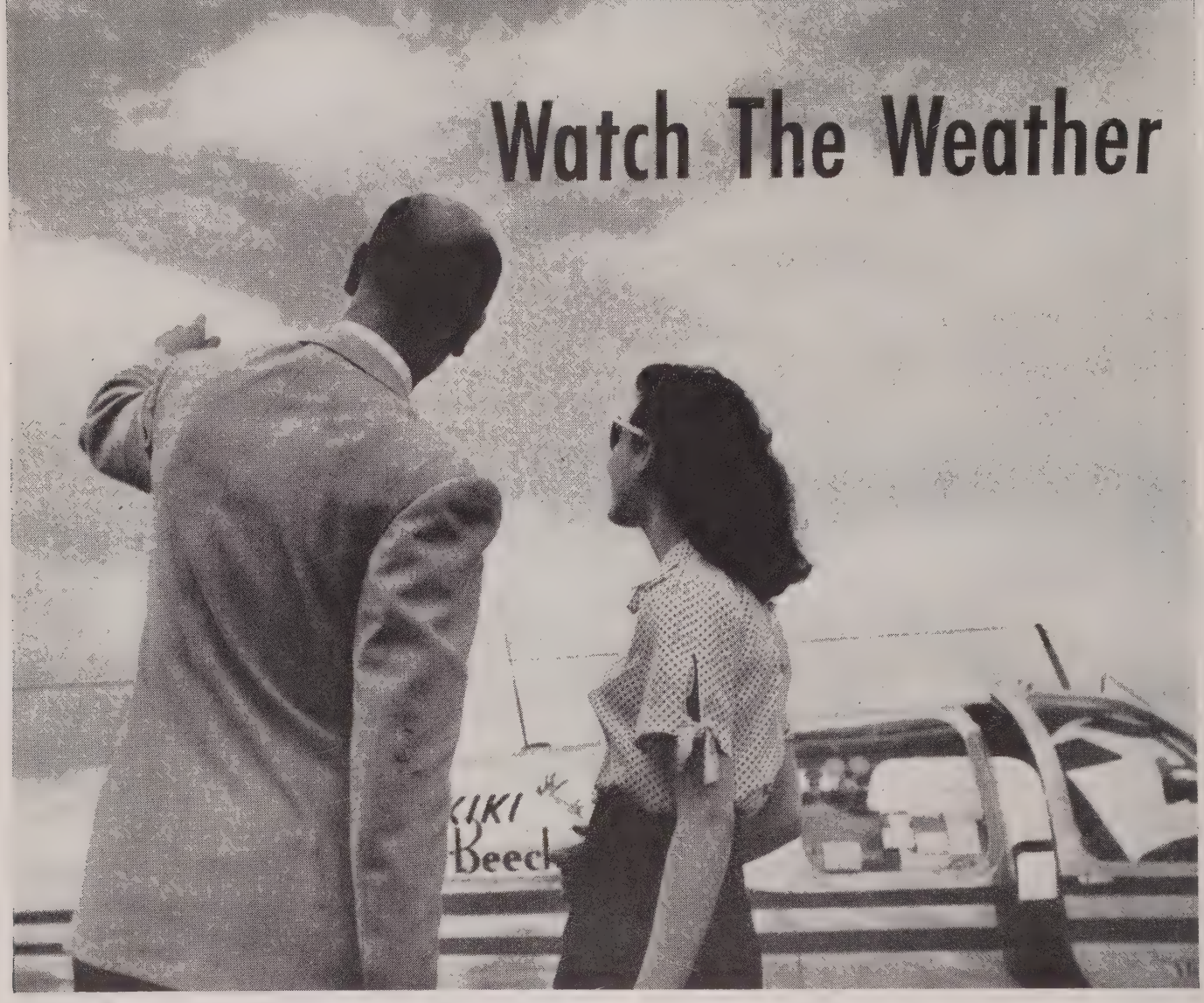
USED-PLANE MARKET VALUES

Compiled from records of Powers & George, Aircraft Brokers, 475 Fifth Avenue, New York, primarily covering 12 Eastern States and the District of Columbia.

Model	Average Asking	Average Bid	Average Selling
** Aeronca Chief ('46)	$ 1275	$ 1100	$ 1175
* Aeronca Super Chief ('46)	1575	1200	1400
Aeronca Sedan (late '48)	4125	3750	3925
**** Beech Bonanza 35 ('47)	6900	6200	6550
*** Beech Bonanza A35 ('48)	9050	8500	8750
** Bellanca Cruisair Sr. ('47)	4150	3700	3875
Bellanca Cruisair 1948	Runs from $300 to $500 above prices '47		
** Cessna 140 ('46)	2050	1550	1800
Cessna 140 ('47)	2400	1900	2175
Cessna 140 ('48)	3150	2600	2800
Cessna 170 ('48)	4700	4000	4300
Cessna 195 ('48)	12,500	10,000	11,000
** Ercoupe ('46)	1600	1000	1300
* Ercoupe ('47)	2100	1500	1800
* Ercoupe ('48)	2850	2450	2675
** Luscombe 8A (Metal Wing)	1500	1000	1300
** Luscombe 8E Deluxe ('47)	2450	1800	2150
** Luscombe 8E Deluxe ('48)	3300	2750	3000
*** N. A. Navion ('47)	6000	5000	5500
*** Ryan Navion ('47)	7500	6800	7200
*** Ryan Navion ('48)	8600	8000	8250
** Piper Super Cruiser ('47)	2200	1700	1900
** Piper Family Cruiser ('48)	3400	2950	3200
** Republic Seabee (500 series)	3500	2500	2800
*** Stinson 150 ('46)	3500	2500	2900
** Stinson 165 ('47)	3750	3000	3300
** Stinson 175 ('48)	4500	4000	4300
** Swift 125 (Globe '46)	2600	2100	2350
** Swift 125 (Temco '47)	3000	2500	2700
Swift 125 (Temco '48)	3600	3000	3200

* Under 100 hrs ** Under 200 hrs *** Under 300 hrs **** Under 400 hrs

Watch The Weather



PILOT ODOM points out "fair weather cumulus" that mean contact flight weather guaranteed for at least 100 miles

Your X-C's will be fun if you'll heed the weather signs . . . and know your weather man

By BILL ODOM

Photos by Bill Price

A PILOT'S best friend is the weather forecaster.

He's also the man who can make your flying really enjoyable—if you give him the chance.

For some reason, there's still a strange air of mystery surrounding the subject of weather in the minds of many pilots. Making friends with the weather man is the best way in the world to dispel this mystery.

The forecaster is the one man who can replace many a haunting worry with understanding in the realm of weather conditions. And with this transition comes a contentment and a confidence that means real flying.

Two flights I have made—one a routine trip out of New York, another which carried me into a 30,000-foot storm over Tibet—have proved this point to me beyond any doubt.

I shouldn't tell tales on a former boss, I guess, but if I can mention how a little knowledge of weather conditions helped a man for whom I used to fly get an entirely different perspective on flying, maybe I can show what I mean.

A New York banker hired me to fly his DC-3. For a long time he would worry about taking off in the rain, but would wonder why we couldn't take off when the skies were clear, even if there was a 300-foot ceiling at the other end of the line. In the air, he was happy when the sun was shining, and miserable when things closed in.

It didn't take long to see that he wasn't getting much of a kick out of it all. I figured

PREFLIGHT calls for last-minute check on teletype reports *(above)* of weather along route of proposed flight, and another close look at weather chart *(below)*. Here La Guardia forecaster Louis Landau checks charts with Odom

that if he could understand the situations we got into, he'd relax and enjoy it all.

One of my favorite books on weather is Jordanoff's *"Through the Overcast."* So, one day I gave him a copy. That did it. On the next trip out of New York, Talbot took the greatest delight in explaining to his guests aboard the plane just what kind of weather we were going through, what made it good or bad, and how long we were likely to be in it. He not only had relieved his own mind, but the worries of everybody else in the plane with him.

There are many ways to learn about weather. The books, of course, are an essential start. My favorite books, incidentally, besides *"Through the Overcast"* are Jordanoff's *"Safety in Flight"* and the standard CAA manual.

Then to help you use what you learn in the textbooks, there are certain "rules of thumb" that will help you judge situations—there is the use of a portable radio in your hotel room, and there are conversations with local pilots when you're away from your home field.

But the best of all ways is to talk to the forecaster. Do it in person if you possibly can, over the phone otherwise. Talk to him as often as you can, on days when you're flying or when you're just thinking about flying. Wander into his office and get acquainted with his charts.

If you don't fly out of a field with a weather station, plan to drop in on the weather men whenever you hit a big field. Don't wait until there's bad weather to get acquainted—you'll be more welcome on good days, as a matter of fact, when there's more time to answer questions.

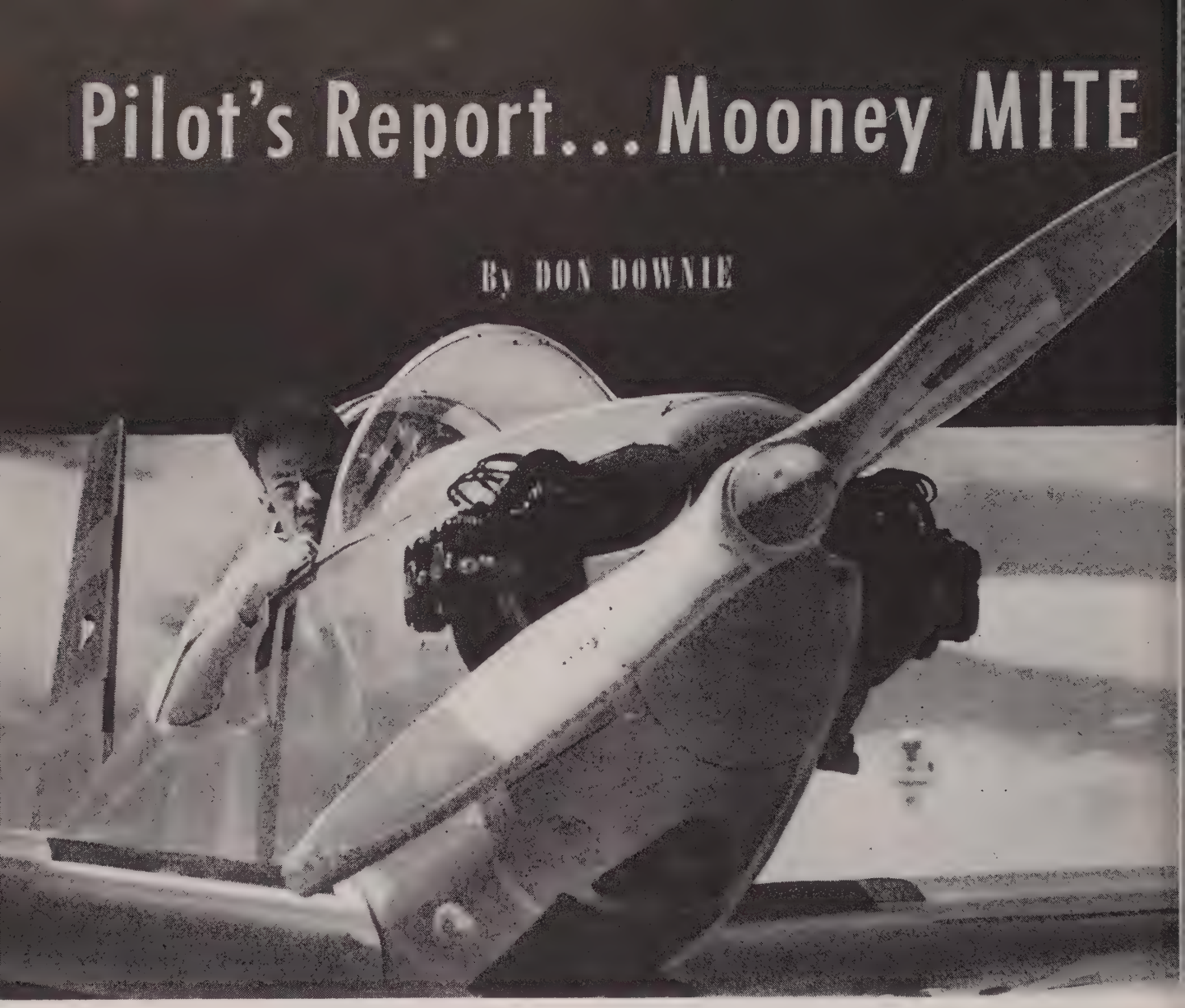
You'll find forecasters cooperative and, contrary to remarks, you'll find the forecasts they make for you are pretty generally correct.

Perhaps a lot of private pilots don't know that a weather bureau will furnish you a complete cross-section outline of the weather between two points, drawn on a special form with cloud formations and fronts sketched in. This is one of the best ways of learning weather as well as one of flying's best safety devices. The next time you fly cross-country, ask for a weather cross-section, even if the weather promises to be good. As you fly, check the clouds predicted with what you find en route, and argue in your own mind why they're there. If you have any questions left over, check with the forecaster at the end of the line. *(Continued on page 50)*

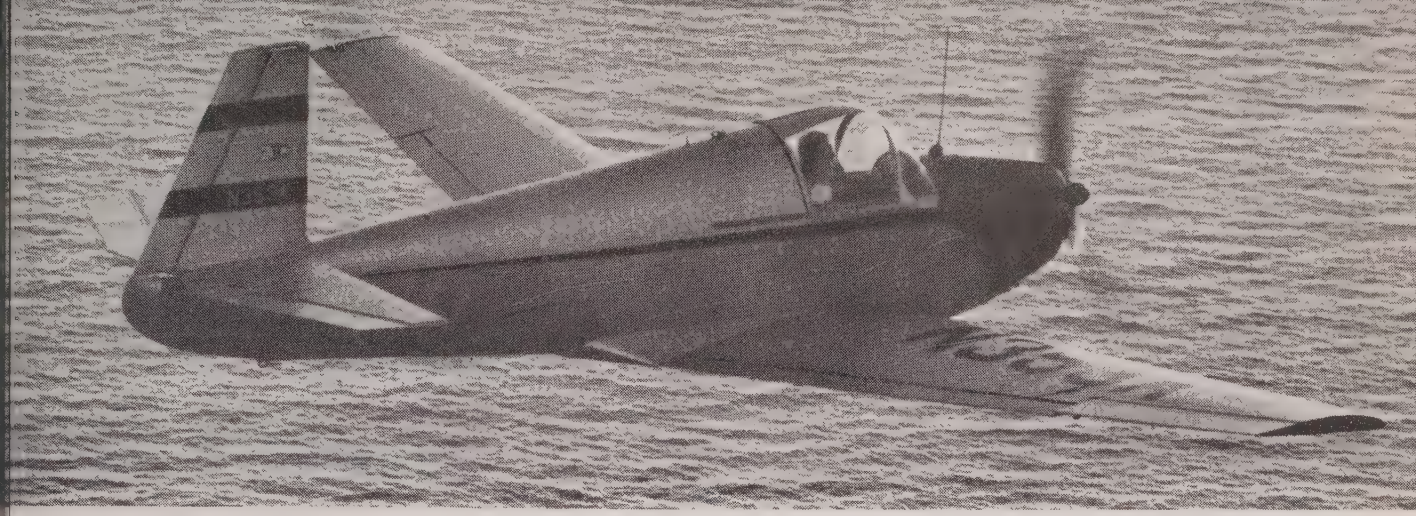
PORTABLE RADIO is valuable for keeping tabs on weather forecasts as well as picking up navigational radio ranges

Pilot's Report... Mooney MITE

By DON DOWNIE



MOONEY single-seater, with Pilot-Author Downie at controls *(above)* is powered by 65-hp Lycoming, and has 27-foot wing span



PEASHOOTER, pint-sized that is, climbed to 12,200 feet at full throttle in 14 minutes. Airspeed was held at 65, 70 mph. Final "test" landing was shot at McCarren Field, Las Vegas, during a private flying fiesta *(below)*

Look at that little devil go up!

If you see a trim little pint-sized peashooter take off almost without a roll and then climb to a thousand feet over the boundary of the airport, it's probably a late-model Mooney *Mite.*

Originally powered with a 24-hp Crosley automobile engine, this one-placer was recently re-designed and licensed to handle a 65-hp Lycoming engine. Performance now is just about out of this world since the published absolute ceiling is over 25,000 feet.

Research flying for this SKYWAYS' pilot report was done during the annual "Holiday On Wings" at Las Vegas, Nevada. The 65-hp Mooney, N353A, was the first high-powered model to reach the Pacific Coast and the fourth

COCKPIT photo of tiny Mooney *Mite* shows the gear-warning wig-wag on upper left of panel. Note flap lever on left

HANGAR APRON-MATE of the little Mooney single-seater was another and somewhat faster one-placer, the F-51 *Mustang*

to be completed at the factory in Wichita, Kan.

"Just how do you check out in a single-place airplane?" We asked George Bontempt, sales representative who flew the Mooney to Las Vegas for West Coast Distributor Harry Royster.

"You just get in and fly it. Come on out to the ship and I'll show you how to get the landing gear up. After that, you're strictly on your own."

The morning was hot and the wind gusty as we walked around the Mooney at the Vegas Sky Corral. In general appearance, the Mooney looks much like the Culver PQ-14 radio-controlled target plane. Aft of the cockpit, the ship is constructed of a plywood monocoque cone. The wing has a wood spar with a leading edge covered with plywood. The tail surfaces are fabric and both rudder and elevators are hinged at their junction point with the fuselage. When you roll back on the trim-tab, the rudder, elevators and tail-cone all move. Shallow-depth flaps cover the whole trailing edge of the wing not devoted to ailerons. The flaps are operated by the trim-tab handle and come down only after the stabilizer is rolled all the way back. Mooney calls this system a "safe-trim" control set-up.

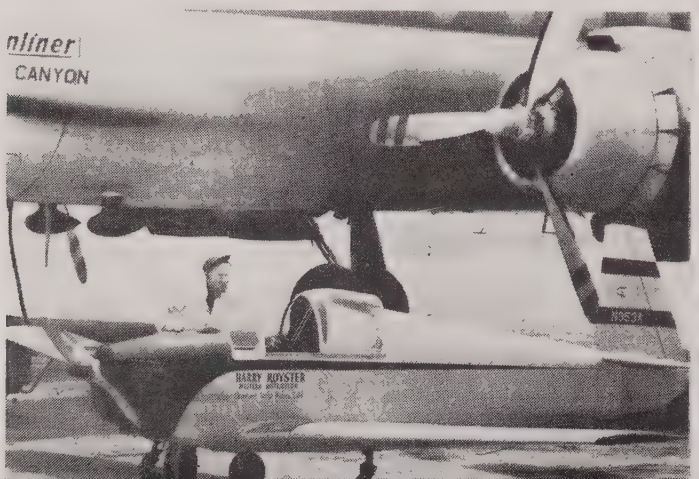
The forward section of the fuselage is built of welded tubing covered with fabric. The cockpit interior is conventional except for the nose-wheel well that humps up from the floor between the rudder pedals and the stick. The Mooney has toe brakes and a steerable nose-wheel.

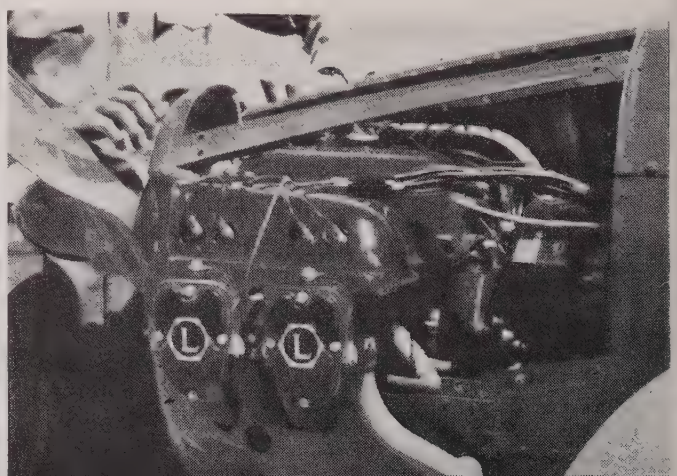
The most unusual feature of this little airplane, not counting its sensational rate of climb, is the neat manually-operated retractable landing gear. A long lever, similar to the parking brake on a pre-war auto, is mounted on the far right side of the cockpit. In the "down" position, this handle locks forward into a slot just above the right rudder pedal. To retract the gear, the pilot merely leans forward, grabs the handle, pulls down on it to release it from the slot and then brings it back about 18 inches into another slot just to the right of the seat. That's all there is to it! No hydraulic pump or electric motor—just dependable pilot-power.

Since the gear-retracting mechanism was the only unconventional fixture on the Mooney, we climbed into the cockpit from the leading edge of the wing and fired- *(Continued on page 49)*

UNITED MAINLINER at Las Vegas really made a midget of the Mooney. Ship's tires originally were for wheel barrows

LYCOMING engine, 65-hp, now powers the Mooney. First engine that powered the tiny ship was 24-hp. Crosley motor





Tricycle-Gear *Cub*

SHOCK CORDS on *Cub's* tricycle gear tend to hold front wheels in alignment and permit short turn of wheel when braked in direction of the turn

If you see a *Cub* with the "new look," in all probability it will be a Junior Piper equipped with a tricycle landing gear. Designed by an Oklahoma engineering company and manufactured by Smyer Aircraft Sales and Service of Ponca City, Oklahoma, the tricycle gear for the *Cub* was first tried out some 18 months ago (SKYWAYS, *February, 1948*). Since then improvements have been made in the unit and many problems overcome so that today volume production is a fact and shipments are being made to *Cub* Distributors who want them.

Installation of the tricycle gear is accomplished by installing the left gear on the right side of the plane, and the right gear on the left side. This moves the wheels back enough to shift weight forward. The nose gear unit is then attached to the lower engine mount bolts and braced by tubes fastened at the fitting that secures the upper end of the cabane vee. The nose gear has its own shock arrangement.

Although the nose wheel is not steerable, all turns are easily made with brakes and rudder.

One important advantage to having a tricycle geared *Cub* is that it permits operation of the lightweight *Cub* in much higher winds, thus adding to the plane's flight time. Other advantages include better visibility, easier landing.

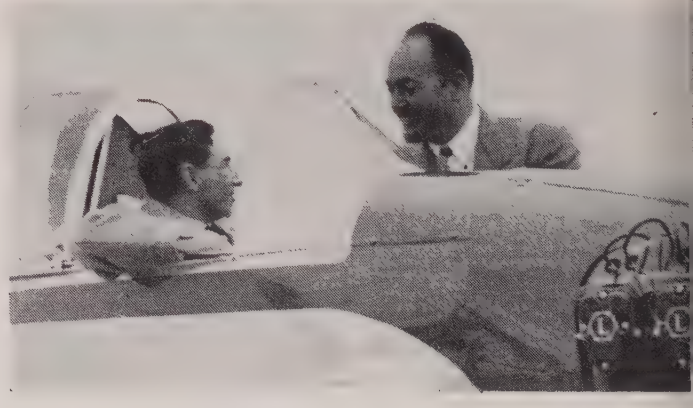
Fully CAA approved for the Continental-powered J-3's, the gear is expected to be approved for the PA-11, too. The unit sells for $260, and installation directions come with it.

NOSE GEAR UNIT is fastened to lower engine mount bolts and is braced by tubes. This gear is fully CAA approved

ACC AIR SHOW

NOTABLES included Dr. Bollinger *(left)*, Mrs. Crocker Snow, Adm. de Florez and Mr. Snow, Mass. Director of Aviation

COCKPIT of the Mooney Mite gets a close look from CAA's John Guisse *(above)*. Next to try on ship for size was Roger Wolfe Kahn, shown here *(below)* with Mooney distributor Eddie Lyons, at the Aviation Country Club show



TIME OUT for lunch found W. T. Piper, Jr., of Piper Aircraft, chowing it with Syd Nesbitt, Beech distributor

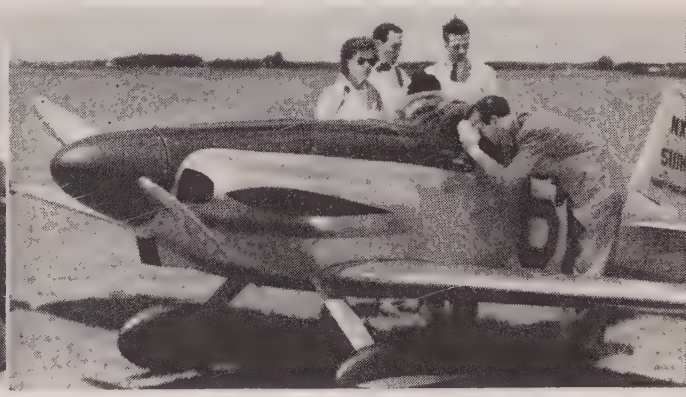
Aviation Country Club air show brings out pilots for new plane test flights

THE Aviation Country Club at Hicksville, Long Island, New York, played host recently at a pilot get-together which saw new aircraft and new models of established planes on the flight line for "test" rides. Among those present were a committee of British air officials, including C. Clarkson, Civil Air Attaché, British Embassy at Washington, D. C., and several plane manufacturers, dealers and noted pilots. Twenty-seven airplanes were on display and "test" flown.

SPECTATOR from afar was Miss Theresa Munez, daughter of Brazilian Ambassador *(above)*. Also of interest to the pilots and aviation enthusiasts who gathered was the DC-3 *(right)* equipped with the Goodyear crosswind gear

LONG-FLIGHTER Capt. Bill Odom flew in to see the show. Greeting Odom on his arrival were Roger Kahn, ACC prexy Payne

MIDGET MUSTANG drew crowds and was one of the new ships demonstrated at the Air Show. Builder Dave Long flew it in



SKYWAYS was represented at the show by *(right)* Mr. J. F. Henry, publisher of Skyways, Mrs. Henry and Flyer Al Bennett

ADF CONTROL panel *(above)* looks complicated, but isn't. Four-band switch is upper left; loop switch lower right

ADF RECEIVER, in this case a Bendix MN-62A, is a good radio-range receiver as well as good direction finder

AERO BIRD DOG

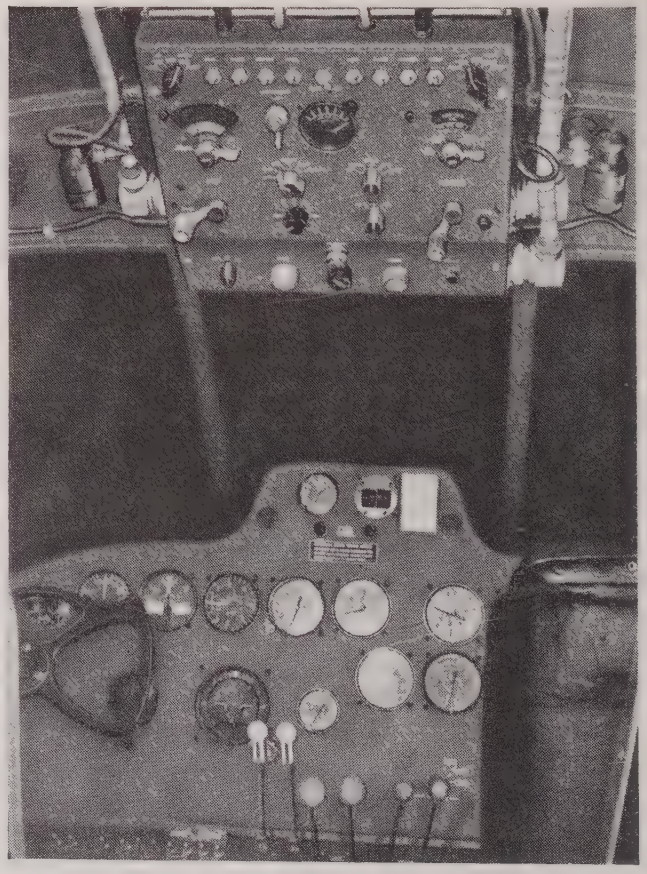
By BEN ROBIN

It's POSSIBLE to walk barefooted, but shoes make the task a lot easier. It's also possible to navigate without an automatic radio compass but that's doing it the hard way. So if your pay load and pay envelope can suffer an additional cut, allow me to suggest ADF (Automatic direction finder) as a piece of equipment worthy of your consideration.

The function and operation of all models of radio compass receivers are similar. Two popular ADF receivers are the models SCR 269 and ARN 7 (both war surplus). Another ADF system—and one of the newest—is the Bendix NA-1, incorporating the MN62, plus the new "Iron Core" Loop. Let's see together what amazing equipment these units really are. What you learn can be readily applied to *any* model radio compass you operate.

Many of your future cross-country flights are going to be off airways. This means you'll probably have no beams to follow. Most radio-range legs are swung to follow the airways which generally connect large cities. If you have no radio compass aboard, you must rely on pilotage—dead reckoning and radio-less navigation. This is really doing it the hard way. How many times have you been flying into the sun on a hazy afternoon and failed to recognize a check point because of the restricted visibility? You can be right on course and still experience all kinds of doubts.

Many of our most experienced pilots (myself included) couldn't do as good a navigation job as some junior birdman on his first solo cross-country if our plane's radio suddenly went



MULTI-ENGINE aircraft often are equipped with dual ADF systems such as this one mounted in an executive plane

LOOP ANTENNA shown here *(above)* is mounted on a *twin-Beech.* Pilot takes an aural null on the loop antenna

RADIO COMPASS is an azimuth scale installed in pilot's compartment *(below).* Needle points to station received

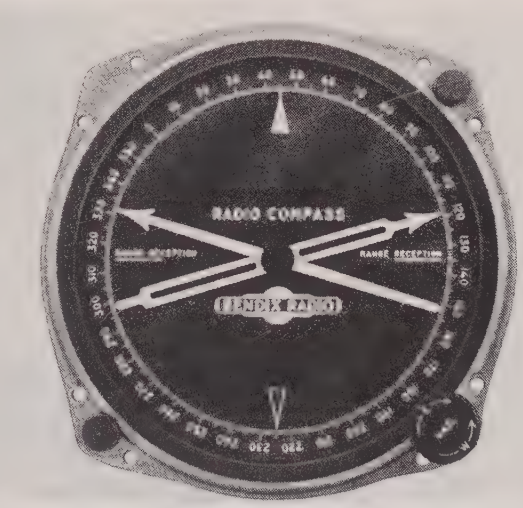
dead. An ADF is the answer. If your next check point or destination has a radio range or standard broadcast station, a radio compass receiver will hunt it down and point out the correct course like a bird dog.

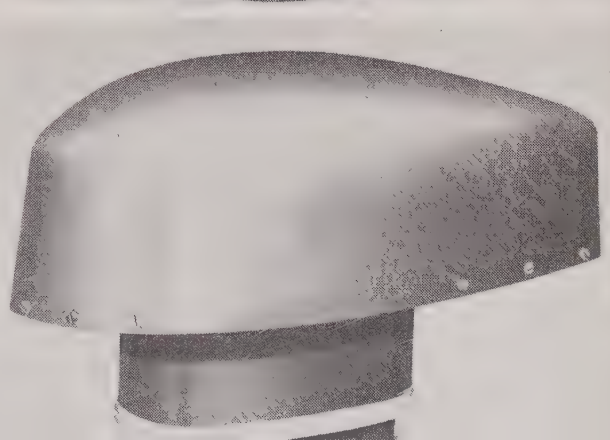
If there is no station directly on your course en route, the ADF receiver and a set of six ADF maps will allow you to plot your position via radio bearings at any time.

Let's assume that you have an ADF installed in your plane. The control panel looks a trifle complicated at first, but it isn't really.

The band-change switch, located on the upper left corner of the panel, selects the group of frequencies you desire. Some ADF models have three bands and some have four, but the frequencies covered on both are approximately 100 to 1750 kilocycles.

The radio ranges can be heard from 200 to 400 kilocycles, and the standard broadcast stations cover the frequency spectrum between 550 and 1500 kilocycles. *(Continued on page 54)*





IRON-CORE LOOP now available is sealed in glass, thus eliminating the need for moisture-absorbing crystals

HOME BASE for Ted Goodwin's flying is the airport at Furnace Creek, 178 feet below sea level and hottest spot in U. S.

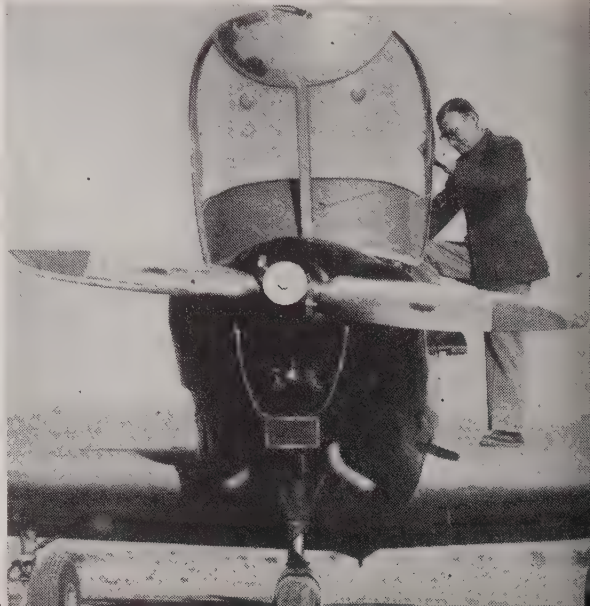
THERE may be super-sonic jet jockeys and torrid buzz boys, but we think the hottest pilot in these United States, bar none, is 60-year-old Ted Goodwin.

He's the hottest pilot in North America because he flies from the hottest spot in the country, Death Valley. For the past 15 years, Ted Goodwin has been Superintendent of the Death Valley National Monument. When the temperature gets up to 134° in the shade and household thermometers literally blow their tops. Mr. Goodwin will probably be out in his Culver "V," scouting the desolate dirt roads of this sun-baked wonderland, in search of unreported sightseers.

Perhaps it dates back to the days when he learned to fly in a *Jenny* 21 years ago, but Mr. Goodwin doesn't like slow airplanes. The two planes he has owned since the war, an old Culver *Cadet* and the *(Continued on page 56)*

WAR restrictions on flying set Goodwin to building models. Note the scale models "surrounding" Mr. and Mrs. Goodwin

PLANE owned and flown by Goodwin and two associates is a Culver "V" purchased after the war



Hot Pilot

By CHASE CRAWFORD

NEW USAF penetration fighter (above) is Lockheed F-90 powered by two turbo-jet engines. Note its needle nose

WINGS of the sleek and fast F-90 are swept back 35 degrees. Plane is now undergoing tests at Muroc Air Base

LOCKHEED men directing design, etc., of F-90 were *(left to right)* Tony LeVier, Viereck, Johnson, Ralston and Palmer

Lockheed F-90

ADD the Lockheed F-90 to the Air Force's stable of transonic fighters. Powered by two Westinghouse J-34-WE-22 engines of 3,000-pounds thrust each, the needle-nosed F-90 is expected to eventually make the Mach 1 speed class. The plane has a gross weight of 25,000 pounds, a wing span of about 40 feet, and is 55 feet long. The ship's two jet engines are mounted side-by-side within its slender elliptical fuselage.

Wing of the F-90 is extremely thin and is swept back 35 degrees. Fuel is carried in the wings and in a tank mounted in the fuselage around the engines. Additional fuel is carried in 220-gallon jettisonable tanks at the wing tips. Range with wing tank is said to be 1,000 miles.

Standard tactical equipment, including pressurized and air-conditioned cabin and pilot ejection seat, is carried. The single-seat cockpit is located well ahead of the wings for extra visibility. Into it Lockheed engineers have built many installation features developed by Joint Cockpit Standardization Committee.

The new F-90, a heavyweight slugger combining speed, range and maneuverability, was designed to fly deep within enemy territory.

AIR FORCE F-90 is almost as large as DC-3. Here a mechanic checks big ship's swept-back tail

FORE-RUNNERS of the F-90 were the famed and favorite F-80, then TF-80C. The F-90 has swept-back wings, more power than F-80

MARINE CORPS men, flown to the beach for the job, fastened JATO racks to FH-1 forced down by jet engine failure

THE Marine Corps recruiting slogan which advertises "Travel and Adventure" held true for a Flying Leatherneck of the Second Marine Air Wing when he became the chief participant in the first actual emergency use of JATO in the rescue of a jet-type plane.

PILOT of FH-1 was M/Sgt Blass

Master Sergeant Lytton Blass, Lafayette, Indiana, one of the very few enlisted jet pilots in the Marine Corps, was flying from Cherry Point, N. C. to Puerto Rico, with Marine Fighter Squadron 122. Purpose of the trip was to participate in the Atlantic Fleet Command exercises —and that's when the "adventure" part of Blass' travels began. In the words of the Sergeant, "We had just gassed up our FH-1's at Guantanamo Bay, Cuba, and were about an hour out cruising along as nice as could be at 20,000 feet over the high mountains of the Dominican Republic. Then it happened—my engines quit! I backed out of the formation, and at 18,000 feet, squared away the cockpit so that I could leave the ship in a hurry if I had to."

Upon orders from squadron commander Major Loren D. Everton, two other pilots, Captain

PHANTOM, now back on her gear, was towed nine miles to an emergency field hastily constructed for FH-1's take-off

JATO take-off and flight to Trujillo successful, Sgt. Lytton Blass accepts congrats of Azua Governor J. Koury

Whitaker and Lieutenant McManus, were assigned to stay with Blass until he was safely on the ground. Whitaker and McManus lost no time in dragging the area for a possible landing place and, fortunately for Blass, spotted a beach in the distance that offered possibilities. The two boys zoomed down over the water's edge and when everything looked okay, radioed back to Blass to make a glide for it.

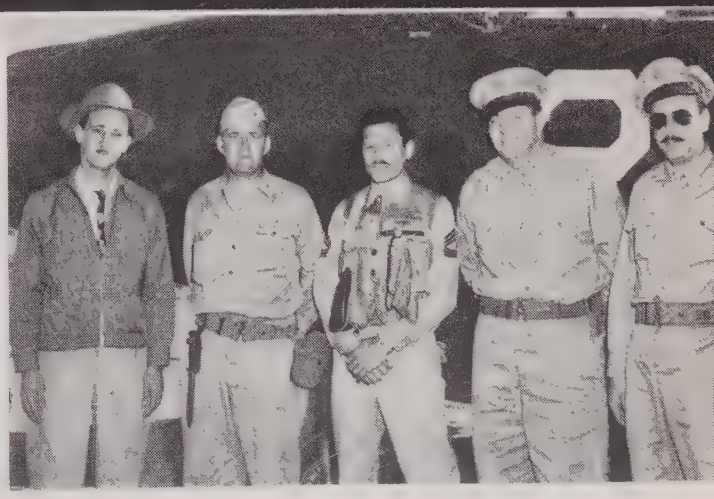
Blass did . . . and was more than a little glad because aside from that beach everything below him was either mountains or lower lands covered with thick jungle. Not much choice . . . but a beach was better than nothing at all.

FH-1 PILOT Lytton Blass lets go with a blast from JATO units and in a few seconds the ship was off the field

OPERATION JATO

By Cpl. WILLIAM DAUM, USMC

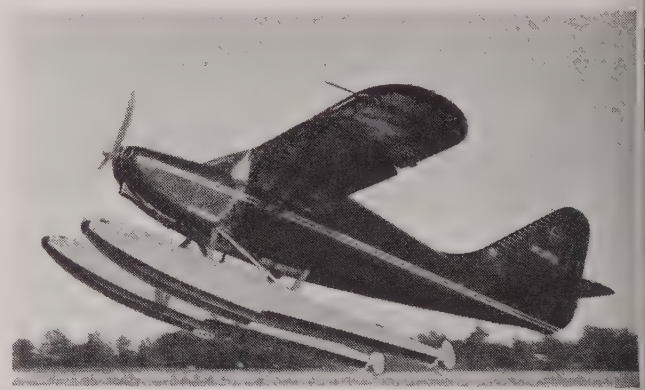
After a dead-stick glide of about 50 miles, Sergeant Blass arrived over the area at 2,500 feet. He made his approach at 150 knots and leveled off for a belly landing at about 85 or 90 knots. Blass went in wheels up . . . and for a good reason. If he *(Continued on page 46)*



OFFICIALS of Dominican Republic posed with Blass *(center)* before he took off from Trujillo for Marine Base

SEAPLANE being taxied to take-off position sits in the water at same attitude it would were engine not running

The following article has been taken from the book "Seaplane Flying and Operations," by Robt. S. Fogg, Wm. D. Strohmeier and the late Capt. D. J. Brimm Jr., published by Pitman Publishing Corporation. Because we feel it is one of the most authoritative books on seaplane flying, a portion is presented here.—Ed.



FLAPS, dropped part way down after ship has attained speed on the step, will lift the plane out of the water

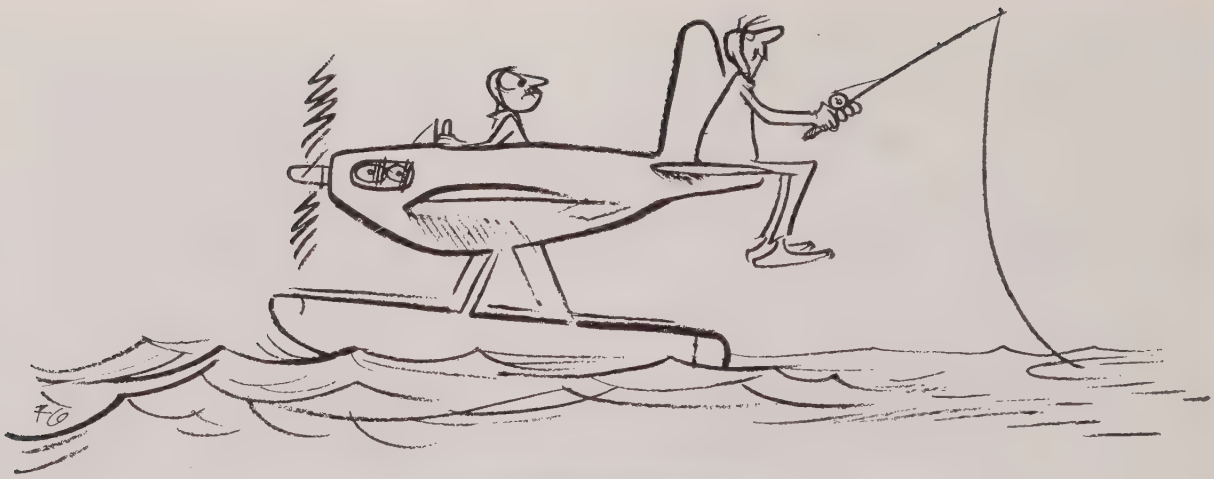
THE question is often asked: "Which is the harder to fly, a landplane or a seaplane?" In drawing a comparison it may be said that in the take-off the seaplane, under certain conditions, calls for somewhat more skill than the landplane; in flight there is no difference, and in landing the seaplane presents much less difficulty.

The landplane is usually flown from at least approximately level ground, with few or no obstacles to keep clear of. Furthermore, such obstructions as may exist are usually fixed. Every take-off with a seaplane is likely to be different as regards the condition of the water; then too, there are often boats moving in front of the ship, and other floating objects which must be watched out for, so that the seaplane pilot must be constantly on the alert. An overload has little effect on the landplane *(Continued on page 58)*

PIPER in this photo has been put on the step. With the throttle left open, stick back, it is about to take off

Getting Off...on Floats

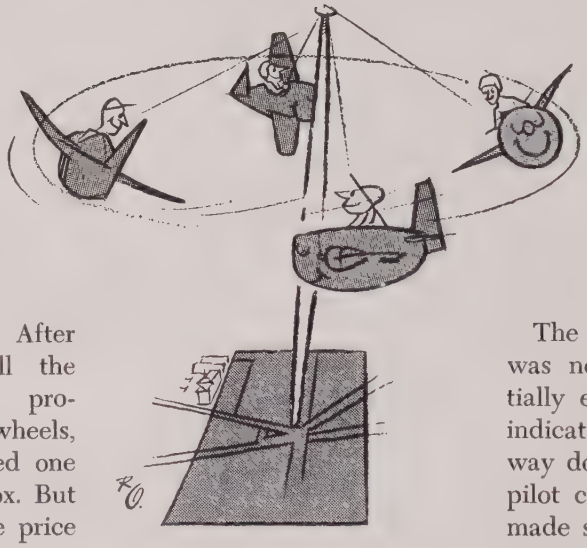
GLASSY WATER forces this Piper (below) to taxi down river to disturb water enough to permit getting off over own wake



DILBERT

By Seth Warner and Robert C. Osborn

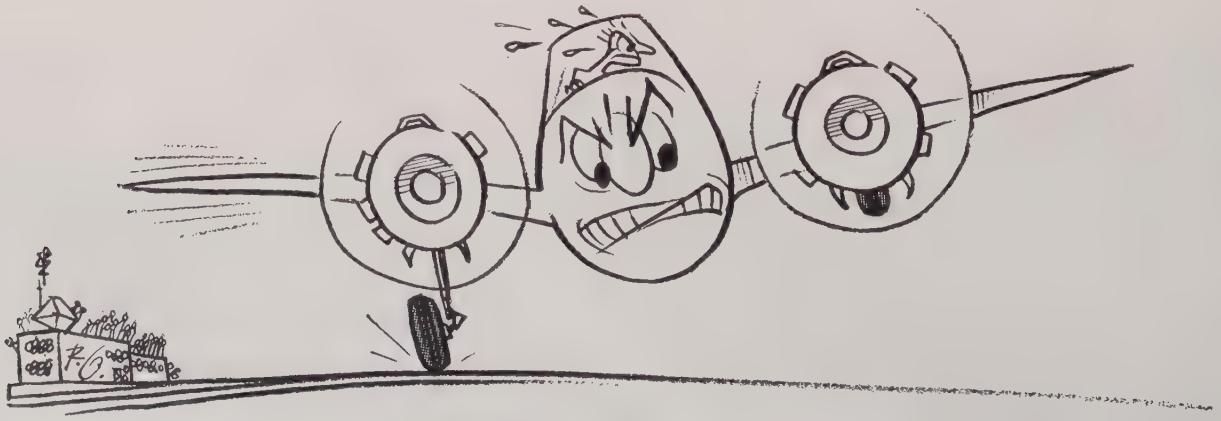
Persistence Personified — We've often heard about Dilbert forgetting to lower his wheels before landing. Here's one about a cargo-plane pilot who was almost forced into the same ignominious position because he couldn't get his down. After unsuccessfully trying all the conventional emergency procedures for lowering wheels, this resourceful pilot tried one that was a bit unorthodox. But it worked, and saved the price of some expensive repairs.

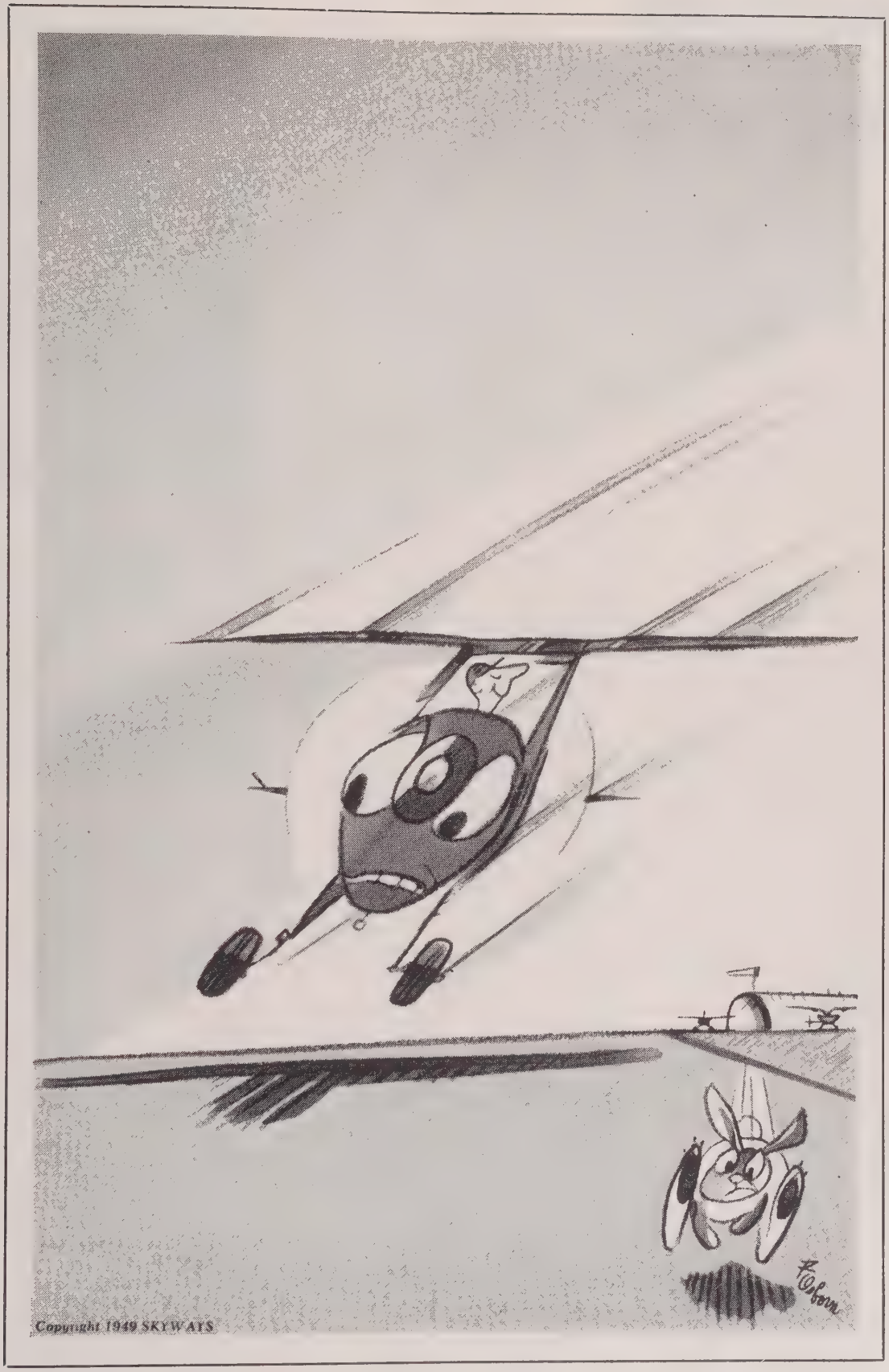


The trouble started when he reached his destination and found he couldn't budge his landing gear or flaps, even though his hydraulic system registered 1500 pounds pressure. The hydraulic selector was then shifted and an attempt made to lower the wheels with the hand pump. This also failed.

The emergency release system was next used. This was partially effective; the right wheel indicated down, the left half way down. As a last resort, the pilot climbed to 2500 feet and made several dives followed by abrupt pull-outs. The left wheel moved on each pull-out, but failed to lock down.

About here most of *(Continued on page 63)*





Dilbert's the skid kid who loses more durned airplanes

CAOA REPORT . .

CORPORATION AIRCRAFT OWNERS ASSOCIATION, INC.

Corporation Aircraft Owners Association is a non-profit organization designed to promote the aviation interests of the member firms, to protect those interests from discriminating legislation by Federal, State or Municipal agencies, to enable corporation aircraft owners to be represented as a united front in all matters where organized action is necessary to bring about improvements in aircraft equipment and service, and to further the cause of safety and economy of operation. The CAOA headquarters are located at 444 Madison Avenue, New York 22, N. Y.

Regular Annual Meeting

On the 25th of May the Annual Meeting of the regular members of Corporation Aircraft Owners Association was held in the Board Room of Bristol-Myers Company, 630 Fifth Avenue, New York City.

A highly interested and articulate list of members attended from as far away as Boston, Chicago, and Columbus, Ohio.

In all, nearly 25 representatives of 13 different member corporations attended. William B. Belden, Chairman of the Board, presided.

John H. Geisse, CAA crosswind landing gear expert, appeared at the invitation of Walter Pague, Chairman of the Technical Committee, and presented the case for that newly developed type of gear.

An interesting discussion by the attending members followed with plenty of comments from both sides. The crosswind gear apparently will save money for the airport builders when there are sufficient aircraft equipped with the new gear. On the other hand there is no need for the new gear until the majority of terminals have but one runway. As Mr. Geisse pointed out, it is a sort of vicious circle with neither principal benefiting until someone breaks the circle and starts creating a need for the other.

Mr. Geisse suggested that CAOA take a stand as to the benefits of the new gear. This matter was referred to the Technical Committee for further study as it was felt that too few (if any) of the member pilots have had any experience with the crosswind gear and its actual use.

At the conclusion of the meeting of the Regular Members, a Directors' Meeting was held.

ADF Can Find Thunderstorms

Something new has been added to air safety by an unnamed airline pilot who reports locating thunderstorms by using his ADF. This highly interesting report comes from the Flight Safety Foundation.

The ingenious pilot reports that his experiments have shown that thunderstorms may be located and avoided by tuning his ADF to the approximate wave length of the cells that produce the most violent turbulence and lightning.

It was determined that these static-producing cells "broadcast" in the 100 to 200 kilocycle range. With this in mind, the pilot tunes the ADF to that range and uses it to locate the most active part of the cell.

The pilot reported that as soon as the needle pointed to within 15 degrees of the heading on either side, an immediate turn away should be made of not less than 45 degrees from the danger area heading, at which the lightning is indicated. The new heading should be held until the bearing of the cell is not less than 90 degrees from the new heading.

If there are two ADF's aboard the aircraft and the ship is on instruments in areas where there are thunderstorms, it was found desirable to keep at least one ADF tuned to 150 kcs for storm-cell location while the other was used for navigation. As soon as the needle of the former begins to oscillate within the 15 degrees of the danger heading, the pilot should make the immediate turn away from that heading if it's along his path of flight.

The pilot reported that the stronger lightning cells operate on a frequency of about 150 to 200 kcs while the less violent ones "broadcast" at about 100 to 150. However, the latter may be accurately located, when close enough, with the ADF and may then be avoided.

Your headquarters as well as the Flight Safety Foundation would be keenly interested in reports from CAOA pilots who try this technique in locating thunderstorms. Please send your experiences to either the Flight Safety Foundation, Room 1320, 515 Madison Avenue, New York 22, New York, or to CAOA headquarters.

The little matter of dodging thunderstorm static cells pays big dividends in both comfort for the executive passenger and greater safety for the aircraft and crew. Anything CAOA can do to help solve the "dodge-the-thunderstorm" problem will pay dividends in both.

CAOA Talks to Denver Council

In this excellent candid shot by Robert T. Schott, of Aviation Operations Magazine, we present your Association Chairman of the Board, William B. Belden, as he spoke at Denver, Colorado, May 4th.

Mr. Belden, Assistant Counsel for Republic Steel Corp., addressed the members and guests of the Airport Operators Council on behalf of all operators of executive aircraft. He pointed out the great number of executive aircraft now in use, the caliber of their crews and their potential as revenue sources for the smart airport operators.

In return for this potential as a market, Chairman Belden passed along many suggestions for better services desired by

WILLIAM B. BELDEN at Denver

executive aircraft operators and CAOA members as expressed by the many letters received by the Association.

The speech was extremely well received and aroused no little comment among the Council members, many of whom had apparently overlooked the "executive" as a real source of income and an increasingly important segment of the aviation picture.

The Dow Chemical Tragedy

We can ill afford to lose either executives or flight crews of the caliber lost to American industry in the tragic crash of the Beech aircraft operated by the Dow Chemical Co., at London, Ontario, this spring.

Knowing the Association's keen interest in the details and causes of the accident, Walter C. Pague, Chief Pilot for Armco Steel Corp., and Chairman of CAOA Technical Committee, took the matter up with Mr. F. B. Lee, Deputy Administrator of the CAA and Mr. E. S. Hensley, Acting Director, Offices of Aviation Safety, CAA.

A letter from Mr. Hensley to Mr. Pague reports as follows: "A final report of this occurrence (The Dow accident) has not yet been completed by the Civil Aeronautics Board. However, preliminary information indicates the crash was a result of the pilot's flying into extremely unfavorable weather in which, it is believed, severe icing conditions were present. The same information indicates that no structural failure occurred."

This report from Mr. Hensley is of vital interest to members flying similar equipment and should do much to reassure executive aircraft operators of the structural strength of their aircraft even under the most extreme flying conditions.

De-icing equipment, it must be remembered, should be used as emergency equipment if *caught* in icing conditions, not as assurance that you can fly safely through icing areas that without de-icers you would avoid.

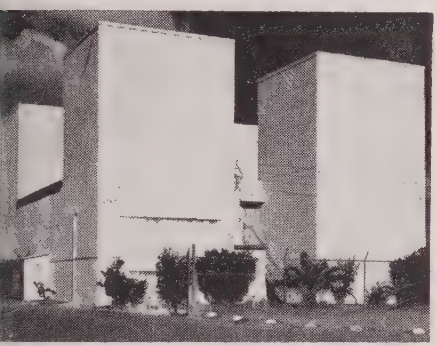
White Paint Outside Cools Inside

United Air Lines has been running a nine months' test that should be of interest to CAOA members. The test has been aimed at cooling the interiors of their aircraft by painting the upper parts of the cabin exterior with white enamel to reflect the sun.

The enamel on one of their five-miles-a-minute airliners flying between San Francisco and Honolulu resulted in cabin interiors being as much as 15 degrees cooler during loading at the terminals. The paint for the entire top of the fuselage added less than 40 pounds to the entire gross weight and only an occasional retouching here and there was required to keep the paint in perfect shape.

It is suggested that CAOA executives might try this system to reduce the temperatures of cabins when the aircraft must be left in the sun for comparatively long periods of time.

Around the Calendar Service



AIRCRAFT SERVICE engine test cells

Down at Miami's 36th Street International Airport, Aircraft Service Corporation offers a special welcome to CAOA members.

Noted for prompt and efficient work, Aircraft Service is well equipped to handle any type of executive aircraft overhaul, maintenance or repair work. The machine shop, engine test cells, carburetor shop, and electrical accessory shops are equipped to handle anything from a DC-4 down the scale to the smallest executive types.

Services offered are all CAA approved, and the men are especially expert in the handling of DC-3 repair and maintenance problems.

The personnel of Aircraft Service are experienced in complete overhaul and conversion work on propellers, radios, instruments, carburetors and all accessories.

Mr. A. C. Kennedy of Air Service Corporation has furnished CAOA Headquarters with a supply of illustrated brochures depicting and describing services that are available to CAOA members.

The New York office of this organization is located at Curtiss Field, Valley Stream, Long Island, New York. Mention CAOA membership when visiting or contacting.

Second CAOA Forum Set for August

The Second Annual CAOA Forum has been set for Wednesday, August 3rd, at the Hotel Statler in Washington. Members will be advised in detail shortly.

Latest CAA Light Signals

(It is suggested that this be posted in cockpit)

Certain changes have been ordered by the CAA in the signals from portable air traffic lights for use by towers handling aircraft without radios or with disabled radios. Please note the change in meaning of flashing red signal particularly. That is an important change.

Color and type of signal	On ground	In air
Steady Green	Clear for take-off	Cleared to land
Flashing Green	Cleared to taxi	Return for landing (to be followed by steady green at the proper time)
Steady Red	STOP!	Give way to other aircraft and continue circling
Flashing Red	Taxi clear of landing area (runway in use)	Airport unsafe, do not land!
Flashing White	Return to starting point on airport	
Alternating Red and Green	General Warning Signal—Exercise extreme caution	

Big Plans Ahead for Newark

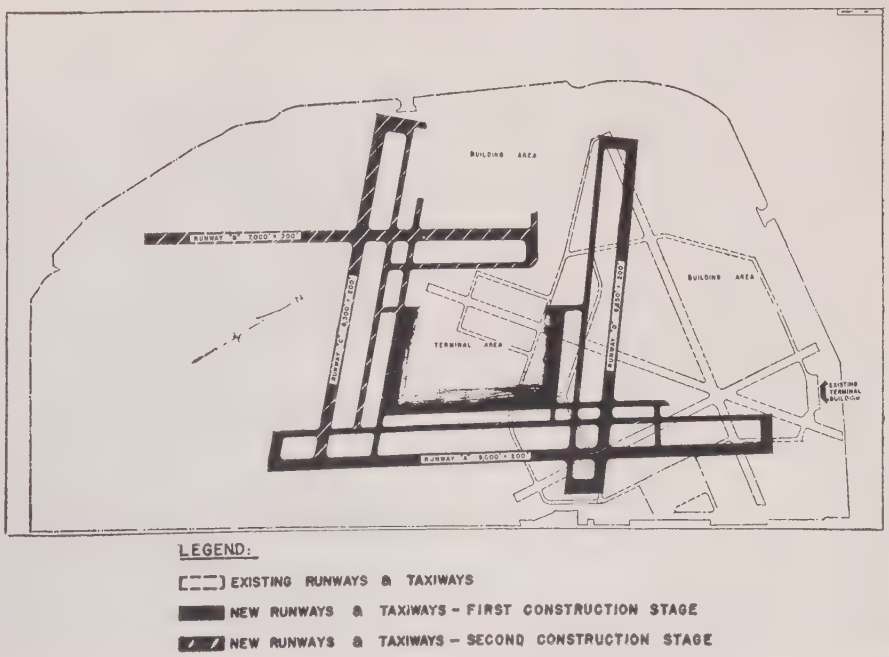
For many years, Newark Airport has been overshadowed by LaGuardia and more recently by New York International Airport. Things will be different from now on if new plans announced by the Port of New York Authority go forward without a hitch. And that seems to be just about what they're expected to do.

The new plans will make Newark Airport equal in size and plane-handling capacity to well-known New York International Airport with a peak hour capacity of a good 120 planes on its 6,000 to 9,000-foot runways.

These open parallel runways will be 200 feet wide and will be able to handle transport planes of 150,000 pounds gross weight. They will be arranged about a new terminal building area to be located directly across the field from the present terminal, as shown in the diagram.

Eight hundred more acres of land in Elizabeth, New Jersey, will be acquired for the expansion and the work will be carried forward in such a manner that the operation of the airport will not be impaired.

The new runways will cost approximately $20,000,000 and will be aligned in two directions at an approximate 90-degree angle to each other and will give coverage under all wind conditions.


BUILDING AREA
RUNWAY "B" 7000' x 200'
RUNWAY "C" 6500' x 200'
TERMINAL AREA
BUILDING AREA
RUNWAY "D" 6500' x 200'
EXISTING TERMINAL BUILDING
RUNWAY "A" 9000' x 200'
LEGEND:
EXISTING RUNWAYS & TAXIWAYS
NEW RUNWAYS & TAXIWAYS - FIRST CONSTRUCTION STAGE
NEW RUNWAYS & TAXIWAYS - SECOND CONSTRUCTION STAGE

Operational Engineering

Service Notes : Ercoupe

A POPULAR two-placer in the private-plane field is the easy-to-fly *Ercoupe,* the all-metal no-spin airplane powered by 75-hp Continental engine. For owners and operators of this airplane, SKYWAYS herein offers service tips to aid in the maintenance and up-keep of their airplanes. Properly looked after, the *Ercoupe* offers many happy hours of trouble free and safe flying.

Fuel tanks: The *Ercoupe* has two wing tanks and a gravity-feed fuselage tank. Planes through serial No. 2622 originally had ternplate tanks (soft sheet steel with a surface coating of 80 per cent lead and 20 per cent tin) which were changed to stainless steel on the last 150 planes of the series. All replacement wing and fuselage tanks for this series have been stainless steel. *Ercoupe* No. 2623 and subsequent had aluminum wing and fuselage tanks installed, and while the aluminum and steel wing tanks are interchangeable, the fuselage tanks cannot be substituted for each other because of structural differences.

The importance of this lies in the fact that an *Ercoupe* equipped with a steel fuselage tank (five-gallon capacity) carries less gasoline than the plane equipped with an aluminum fuselage tank (six-gallon capacity), making a difference of one gallon in the total capacity since the wing tanks, whether aluminum or steel, each hold nine gallons, resulting in a total capacity of 23 gallons for the plane with a steel fuselage tank against 24 gallons for the aluminum fuselage tank combination.

The wing tanks form the leading edges of the wing roots and are filled through necks at their outer ends. Fuel is pumped by an engine-driven pump from the interconnected wing tanks to the fuselage tank and then is fed by gravity through a filter bowl to the carburetor. Remember: *Ercoupes* up to serial No. 2623 have 23 gallons total capacity; all after that serial have 24 gallons capacity.

Fuel quantity gauges: Gauge for the fuselage tank consists of a bent steel wire supported by a cork float, the wire sliding through an opening in the tank cap. Gauges for steel and aluminum tanks are not interchangeable because of the capacity difference. Gauge for steel wing tanks is similar to fuselage type and is located in right tank. Gauge for aluminum wing tanks is a swinging arm type using a cork float on a wire arm and this is located in the left tank. The indicating quadrant is visible through a window in the gauge plate.

Oil system: The left side of the hinged engine cowling provides access to service oil at the left of the engine through the tank filler neck. The tank has a normal capacity of one gallon.

Hydraulic brake reservoir: Located on the bottom forward side of the firewall, should be kept full; service only with AN-VV-O-366b petroleum-base hydraulic fluid.

Hydraulic brakes: A Hayes brake using an expander tube and six brake shoe blocks to apply braking force to the wheel drum was used on *Ercoupes* 113 to 812, inclusive. All subsequent *Ercoupes* are equipped with Goodyear single disc brakes. Both types of brakes use the same master cylinder and tubing, except for a slight difference in line routing at the main gear. When new, each of the six blocks of the Hayes brake is 3/32 of an inch above the retaining spring slots, and may wear without loss of braking until the retaining spring becomes exposed to the drum, but it should be replaced before that, when a block has worn within about 1/32 of an inch of the spring slot. The Goodyear brake linings are .460-inch thick and both should be replaced when either lining measures less than ⅜ inch.

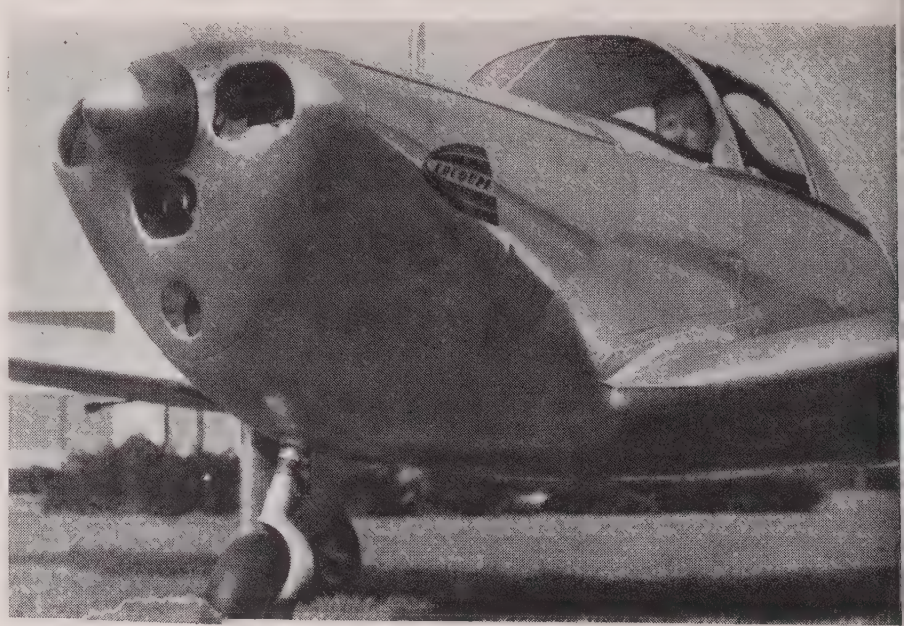
Nose landing gear: Generally unchanged since serial No. 113 it has had several minor modifications, but except for the first 10 postwar *Ercoupes* (to serial No. 123) there is complete interchangeability of installation. For complete details of modernization and rebuilding of a nose gear see the appropriate *Ercoupe* Service Memorandums. In normal position, plane at rest, approximately 3 to 3¼ inches of the strut cylinder should be exposed. Normal tire pressure for the 5.00 x 4 nose wheel tire is 20 pounds.

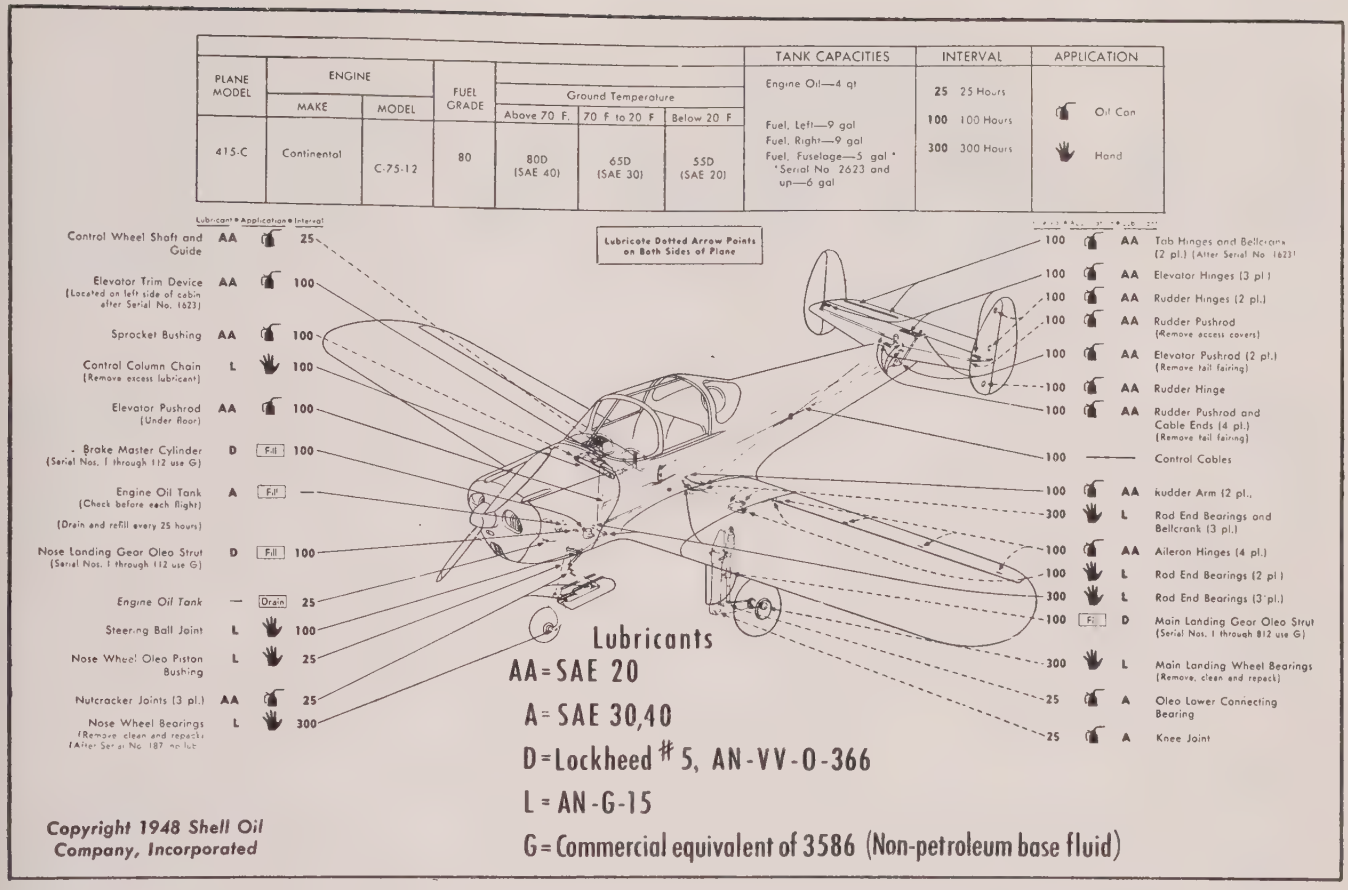
Main landing gear: Ercoupes up to serial No. 813 were outfitted with Hayes 7.00 x 4 main wheels and Lockheed (non-petroleum oil base) hydraulic fluid and natural rubber seals were used in the shock struts. Later planes (serial No. 813 and up) mounted Goodyear wheels and brakes with 6.00 x 6 tires and use AN-VV-O-366 petroleum-base hydraulic fluid in the shock struts, which have synthetic rubber seals. The two types of hydraulic fluids are emphatically not interchangeable, so users of the older *Ercoupes* have to be careful when replacing fluid to be sure to use the proper type. Mixed fluids will result in gumming and leaks due to breakdown of the seals. Each strut should be filled in its fully extended position with the bumper rubber on the gear arm removed and fluid level should be up to filler opening. Shock absorbers are rubber compression discs retained by cupped aluminum alloy plates which are cemented to the discs with Vulcalock cement. Normal tire pressure for Hayes 7.00 x 4 main wheels is 14 pounds; the Goodyear 6.00 x 6 takes 17 pounds.

Battery servicing: The 12-volt, 24 ampere-hour Reading 24 RL non-spill battery is housed in a battery box under the right side of the baggage compartment in the fuselage. The electrolyte level in batteries having a horizontal level plate should be no higher than flush with the plate; in batteries without the plate, level should not be more than ¼ inch above the separators.

General lubrication: See chart and accompanying list of lubricants and periodic inspections. When operating in dusty conditions wash all exposed bearings, except ball and rod end bearings, with kerosene or cleaning fluid and re-lubricate every 25 hours. Keep inner cylinder of nose gear strut wiped clean and dry.

MAINTENANCE costs of two-place *Ercoupe* will be low if owner heeds Manual information




PLANE MODEL
ENGINE
MAKE
MODEL
FUEL GRADE
Ground Temperature
Above 70 F.
70 F to 20 F
Below 20 F
415-C
Continental
C-75-12
80
80D (SAE 40)
65D (SAE 30)
55D (SAE 20)
TANK CAPACITIES
Engine Oil—4 qt
Fuel, Left—9 gal
Fuel, Right—9 gal
Fuel, Fuselage—5 gal *
*Serial No. 2623 and up—6 gal
INTERVAL
25 25 Hours
100 100 Hours
300 300 Hours
APPLICATION
Oil Can
Hand
Lubricant • Application • Interval
Lubricate Dotted Arrow Points on Both Sides of Plane
Control Wheel Shaft and Guide AA 25
Elevator Trim Device (Located on left side of cabin after Serial No. 1623) AA 100
Sprocket Bushing AA 100
Control Column Chain (Remove excess lubricant) L 100
Elevator Pushrod (Under floor) AA 100
Brake Master Cylinder (Serial Nos. 1 through 112 use G) D Fill 100
Engine Oil Tank (Check before each flight) A Fill —
(Drain and refill every 25 hours)
Nose Landing Gear Oleo Strut (Serial Nos. 1 through 112 use G) D Fill 100
Engine Oil Tank — Drain 25
Steering Ball Joint L 100
Nose Wheel Oleo Piston Bushing L 25
Nutcracker Joints (3 pl.) AA 25
Nose Wheel Bearings L 300
(Remove, clean and repack)
(After Serial No. 187 oil lub.)
100 AA Tab Hinges and Bellcrank (2 pl.) (After Serial No. 1623)
100 AA Elevator Hinges (3 pl.)
100 AA Rudder Hinges (2 pl.)
100 AA Rudder Pushrod (Remove access covers)
100 AA Elevator Pushrod (2 pl.) (Remove tail fairing)
100 AA Rudder Hinge
100 AA Rudder Pushrod and Cable Ends (4 pl.) (Remove tail fairing)
100 Control Cables
100 AA Rudder Arm (2 pl.)
300 L Rod End Bearings and Bellcrank (3 pl.)
100 AA Aileron Hinges (4 pl.)
100 L Rod End Bearings (2 pl.)
300 L Rod End Bearings (3 pl.)
100 Fill D Main Landing Gear Oleo Strut (Serial Nos. 1 through 812 use G)
300 L Main Landing Wheel Bearings (Remove, clean and repack)
25 A Oleo Lower Connecting Bearing
25 A Knee Joint
Lubricants
AA = SAE 20
A = SAE 30,40
D = Lockheed # 5, AN-VV-O-366
L = AN-G-15
G = Commercial equivalent of 3586 (Non-petroleum base fluid)

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LUBRICATION CHART indicates key points on the *Ercoupe* that require periodic re-lubrication

Power Plant—Tips and Tolerances

Engine: The Continental Model C-75 installed in the 415-C delivers 76 bhp at 2275 rpm; static rpm with a standard wood propeller should be 2100 maximum. The Series 12 engine has an SAE No. 1 taper propeller shaft while the 12F has an SAE Type 1 flange for propeller mounting. The only difference in the two engine types is the propeller and spinner required for each. For alternate propeller installations, including automatic, and for spinner modifications, check *Ercoupe* Service Memorandums.

Oil system readings: Oil temperature range—90 degrees to 220 degrees. Oil pressure—10 psi to 40 psi, with 35 normal preferred.

Ignition system: Equipped with Eisemann LA-4 magnetos and Champion unshielded C26 spark plugs or shielded C26S.

Engine idling: 650 rpm preferred. Adjustments should be made according to the Continental Service Manual, as should all other engine work and repairs that might be necessary.

Flight Controls—Tension and Travel

Ailerons: In any field repair of the ailerons there is a possibility of some warpage of the trailing edge; ½ inch of misalignment of the trailing edge at the wing tip is permissible. In neutral, both ailerons should fair with the center section trailing edge. Adjustment of ailerons and controls: Re-adjustments must follow directions outlined in the *Ercoupe* Service Manual. With tail depressed and nose wheel clear of ground to allow linked nose wheel freedom of movement, with cockpit control wheel thrown 90 degrees, the ailerons should have a normal differential action of 20 degrees up and 10 degrees down.

Elevator control system: Cable tension —160 to 190 pounds. Travel—13 degrees up, 12 degrees down. Allowable tolerances are measured in inches from an up reference mark (drilled hole on inboard skin of rudder on serial No. 2123 and subsequent), plus or minus ⅛ inch, while down travel is 2⅞ inches, plus or minus ½ inch.

Rudder control system: With system in neutral, cables should have tension of 60 to 70 pounds. Travel—with control wheel at maximum (150 degrees) outward rudder deflection should be 20 degrees and inward deflection three degrees.

Caution: Modification improvements in various parts of the *Ercoupe* control system at different production periods resulted in changes in methods of trim and surface control adjustments on planes which have these modifications, largely in the elevator trim system. For maximum operational utility and safety, necessary adjustments should be made only by factory approved service operators.

General:

Many maintenance tips and directions not included in the *Ercoupe* Service Manual are part of *Ercoupe* Service Memorandums and these are designated in the Manual. A master list of production modifications made on all *Ercoupe* 415-C airplanes is included in the Manual. Following is partial list of some important changes, with the factory serial number of the plane on which each became effective.

Elevator trim device changed from bungees on control column to spring on elevator—213. Engine oil cooler removed as necessary only in extremely hot climates —233 (kit available to re-install on any plane when found necessary). Wheels and brakes changed from Hayes to Goodyear—813. Engine side cowling reinforced and hinge made interchangeable—1122. Elevator trim changed from spring on elevator controls to servo tab on right side of elevator trailing edge—1623. Fuselage tank material changed from ternplate to stainless steel—2469. Engine cowling fasteners changed from Dzus to Camloc—2623. Fuselage and wing fuel tanks changed to aluminum—2623. Adjustable nose gear push rod used—4140. First Model 415-D—4424.

All repairs, adjustments and replacements that are other than routine, must be made by or under the direction of a licensed A & E according to the CAR's. The manufacturers of the *Ercoupe* suggest that for all service, alterations and repairs made on the *Ercoupe,* reference should be made to the company's Service Manual, Service Memorandums, the Continental Service Manual for the engine and CAM 18 for structural maintenance, repair or alteration.

Any particular problem concerning maintenance or operation of the *Ercoupe* should be submitted to Sanders Aviation, Inc., world-wide distributor for the Ercobuilt *Ercoupe,* at Riverdale, Maryland, or to the local *Ercoupe* service dealer.

C.A.P. News from Hq.

Operations Stork
Ord, Nebraska: Civil Air Patrol airmen attached to the Nebraska Wing came to the rescue recently in a race with the stork. A rancher near Ord phoned CAP and reported his wife was expecting a baby and had to be flown to the hospital because local roads were impassable. Word was passed on to Pilot Vernon Nay who lost no time in getting his plane out and ready to go. In short order, Nay flew out to the ranch, picked up the rancher's wife, ferried her to Ord where she was whisked to a hospital . . . in plenty of time for the blessed event.

New Ranks Noted
Cut Bank, Montana: Word of changes in personnel status has been received from one of the most active CAP Wings in the country. The promotions include: to Major —Joseph I. Chitwood; to Captain—Harold T. Chow; to 1st Lieutenant—Victor K. Ario and Clive E. Davis; to 2nd Lieutenant—Felix F. Bonnet and Ralph E. Getter.

Pilot ratings have been awarded to: Dale H. Uppinghouse, H. L. Casebeer, Leroy J. Keilman, Ora F. Lohac, Donald A. Ross, Alan J. Anderson, George A. Fagan, J. E. Hupp, Victor K. Ario, Clive E. Davis, and Robert J. Osburnson.

Observers are: Bill Ropor and Arthur A. Arras, Jr.

Captain Harold T. Chow has been named Wing Operations Officer.

CAP-ers Outwit Coyotes
Craig, Colorado: Two Civil Air Patrol flyers, Jay Brinker and P. Jones, cheated a pair of coyotes out of an antelope dinner recently. While on a routine flight north of Craig, Brinker spotted two coyotes pussyfooting around a buck antelope which seemed to have its hind foot lifted high off the ground. Brinker and Jones buzzed the area and discovered the antelope's foot was caught between two strands of barbed wire. The coyotes apparently were waiting until the antelope became too weak to defend itself with its sharp front hooves.

The CAP boys returned to Craig and told Game Warden Bill Roland what they'd seen. The three of them then bundled into Roland's car and drove to a point within three miles of the antelope. The rest of the distance they traveled on foot, rescued the antelope by cutting the barbed wire, then took the weary animal back to Craig for a bit of nursing. The next morning Warden Roland trussed the 150-pound buck antelope, loaded it into a truck and began a tour of the mountain roads. Spotting a huge herd of antelope, Roland released the animal and watched it hightail its way back to the herd.

Warden Roland now is just one of a long list of game wardens who know and appreciate from personal experience the wonderful all-round job the Civil Air Patrol is doing.

CAP Band
York, Pennsylvania: Civil Air Patrol members of the 32nd Squadron, Pennsylvania Wing, have organized a band, reported to be the only CAP band east of the Mississippi River. Under the direction of Lieutenant Raymond O. Picking, the 55-piece CAP band from York boasts musicians ranging in age from 12 to 55. While the real small fry are too young to be members of CAP, they are enthusiastic in their musical support of the organization and are headed for membership when the right age is reached.

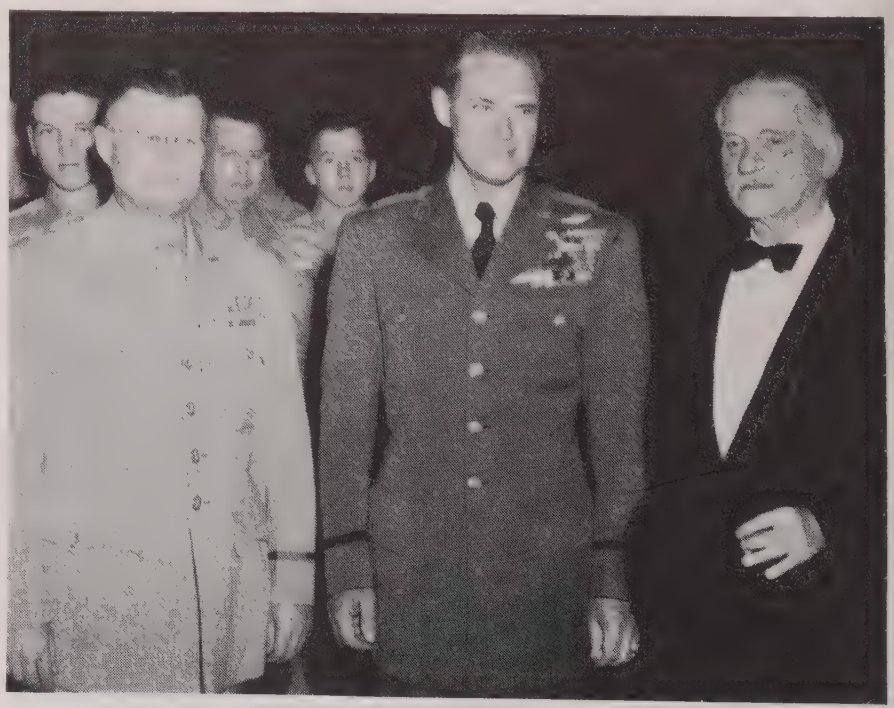
Cadet Recruiting Drive Begins
El Monte, California: Capt. Henry W. Livermore, Commanding Third Group, and Lt. H. C. Schrey, Commanding El Monte Squadron, Civil Air Patrol, announce the beginning of a recruiting drive for Cadets to take an active part in the functions of the CAP at El Monte Airport.

Cadets must have reached their 15th birthday to be eligible; they must maintain normal grades in school and be of good character. As an added incentive, the El Monte Squadron has established a training program on a competitive basis with a Private Pilot Flying course for the "Cadet of the Quarter." Thus, one Cadet will learn to fly each three-month period of the year. The next four top-ranking Cadets will receive enough flight training to enable them to solo.

CAP License Plates for Cars
Richmond, Virginia: Through the cooperation of the Division of Motor Vehicles, Commonwealth of Virginia, a special block of state license plates has been assigned to the Virginia Wing of CAP. All the plates have the prefix number 32 (the Wing designation), followed by three digits. These three digits begin at 001 and end at 500.

If you're driving around the state of Virginia and spot a license plate that reads 32-145, for example, wave Hullo to a fellow Civil Air Patrol member.

From Rehearsal to Real Thing
Omaha, Nebraska: Nebraska cadets of CAP were setting up a practice run for flood control work and were having a nice time with their walkie-talkie units when Capt. Frank M. Bowman, liaison officer assigned to the Nebraska Wing, contacted them from his T-6. Capt. Bowman told them to move over to an area a few miles away where flood waters actually had broken over temporary dikes near Ashland, and families were being evacuated. The disaster unit moved quickly to the new location and did yeoman service, assisting in rescuing people and livestock from the inundated area.



CAP DINNER in Washington was attended by USAF Chief of Staff Gen. Vandenberg *(center)*, Gen. Carl A. Spaatz *(right)*, shown here with CAP's Nat'l Commander Maj. Gen. L. Beau

Low and Slow

(Continued from page 15)

50-foot obstacle in less than 300 feet. Current light craft require from about 900 feet to as much as 1600 feet to take off and clear a 50-foot obstacle.

This means that if the Koppen-Bollinger plane was placed on the goal line of a football field, it would clear a five-story building by the time it had reached the other goal line! As a matter of fact the *Helioplane* can land and take off from an area no bigger than a tennis court, or roughly the space required for a 'copter.

Cruise under perfect control down to 27 mph. Existing lightplanes can get down as low as 45 mph but they are definitely in the dangerous stalling zone that only expert piloting could maintain. Given a light wind of 10 mph, the ship can land with a ground speed of 17 mph, and stop in 16 yards. Today's aircraft need about five times that much room.

Cruise at 108 mph on only 85 horsepower. Thus, despite its low speed the private pilot will be able to get somewhere in the K-B plane.

Climb at an angle of 18 degrees—three times that of the usual lightplanes.

In these performances Koppen and Bollinger believe their plane can accomplish 90 per cent of a helicopter's everyday utility with a safety which they believe exceeds that of rotary-wing aircraft.

In their whole design philosophy the two professors have endeavored to make their aircraft as uncomplicated and as simple to operate as an automobile. They have taken the position that a private plane should make as many automatic mechanical flight adjustments as possible. In the *Helioplane,* they feel, an average person should be able to climb into the cockpit, warm up the engine so that it will not quit on full power, open the throttle and fly away.

Ordinarily, the two men pointed out, a citizen can't become a pilot in most conventional aircraft until he has mastered a check list. This is a mandatory device for assuring that all the important switches, valves and controls are thrown or adjusted prior to take-off. This checking places a heavy burden on the civilian pilot, they claim, compelling him to calm, self-discipline and infallibility at a time when he is apt to be most flustered.

By employing two items not ordinarily installed on light aircraft—automatic pitch control and injection carburetion—Messrs. Koppen and Bollinger have endeavored to eliminate prolific sources of aircraft accidents. The fuel injector, they pointed out, does not need a heat control, and elimination of this item removes one of the common causes of engine failure. A fuel system is used, furthermore, which does not need to be shut off when the aircraft is on the ground.

Very large flaps permit the K-B plane to develop tremendous lifting power at take-off and enable the plane to rise at a sharp angle of ascent. This plane can do the unheard of feat of taking off with such large flaps, full down, despite the economically small 85-hp engine.

A silenced exhaust and quieted propeller carry out the two men's contention that the elimination of noise will go far toward removing one of the greatest public objections to airports in the vicinity of residential areas. Lack of noise will permit the development of closer-in fields and thus augment the utility of the private plane, the two professors claim. This noise elimination is, of course, not a new feature but involves the use of noise reduction principles demonstrated to the industry by the National Advisory Committee on Aeronautics two years ago.

Simplified controls and instrument panel emphasize the Messrs. Koppen and Bollinger's feeling that private pilots should be concerned only with a stick and throttle and should face a minimum of dials etc.

As only experienced pilots can consistently land cross wind with ease in a lightplane, Koppen and Bollinger have incorporated the CAA-sponsored swivel landing gear as standard equipment. Its addition, they believe, will make small, home-made single strips usable and makes emergency landings possible in small areas.

The new set of problems generated by the slower speed of the K-B plane has been solved, the two professors believe, by the unique yaw control arrangement developed by Professor Koppen. This synchronized rudder-aileron arrangement for yaw control, Professor Koppen said, provides the coordination that a highly trained pilot would produce if he reacted perfectly and instantaneously.

Slow speeds in aircraft, the Messrs. Bollinger and Koppen are aware, are not new. But one of the two fundamental difficulties which Koppen has solved is that of control and stability at low speed.

The other great problem was quick take-off in a slow-flying aircraft. Though pilots could get them down into relatively small fields they couldn't take off again in the same space.

Quick take-off has been achieved by utilizing a unique type of two-bladed propeller which is of greater size than a standard lightplane prop. The large curved blades of the K-B prop are, indeed, enormous, against the small plane.

In round figures, therefore, the plane with its over-sized prop and large flaps can produce an initial thrust for take-off acceleration with its 85-hp engine that conventional planes can produce only with an engine of twice the horsepower. An engine of the latter size would be out of the question, moreover, on the points of use and economy in such a small aircraft.

Through the use of leading-edge slots, the K-B design cannot be stalled, even though the pilot has an unrestrained degree of elevator control. It is this device —old in the art of aeronautics but new in its practical adaptation to modern light aircraft—which makes the K-B plane's minimum speed of about 27 mph safe for the amateur to use.

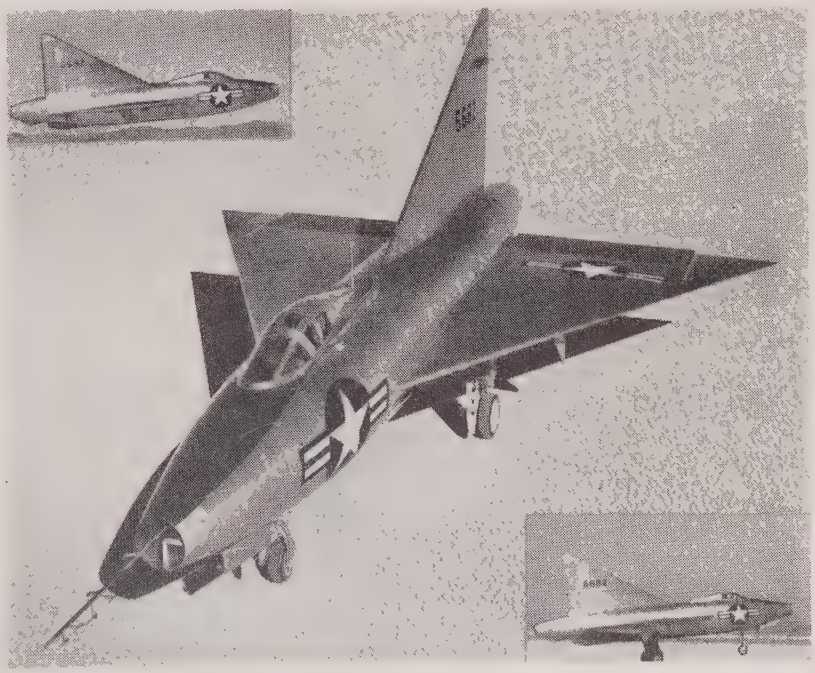
A lightplane, as pilots know, tends to climb sharply when the engine power is suddenly increased. This is offset in the K-B design by depressing the engine angle four per cent. Old time pilots, the professors realize, may snort at such a detail and argue that any pilot should know this tendency and correct for it.

But here is another way, the two men claim, to build safety into a plane by designing performance so that it will not frighten an inexperienced pilot.

Koppen and Bollinger pointed out that there is a whole new concept of safety in the ability of their plane to fly slow under control. The plane's rugged structure takes this factor into account as well.

In case of a weather shutdown, the

(Continued on page 44)



USAF Research Ship

Consolidated Vultee's delta-wing Model 7002 is still at Muroc undergoing flight tests by the USAF. Jet powered, this research airplane was built to prove design superiority of the delta wing configuration over conventional swept-back wing.

Low and Slow

(Continued from page 43)

Helioplane, they say, can fly under very low ceilings, much lower than could be flown by a conventional lightplane with safety. If the weather goes down to the ground or closes in behind the pilot, or darkness overtakes him, he can put the K-B aircraft down on a patch of ground that he would hesitate to trust in a faster landing plane. Slow landing and approach speed, moreover, provides more time to look around for a landing spot.

A great number of crashes in high terrain are caused simply by pilots trying to sneak out under the weather and over the hills. If caught, however, and the aircraft tangles with some obstacle, another great advantage of their design—its slow speed—becomes apparent.

Crash research, the two men explained, shows a disproportionate gain from slower flying speed since the force of impact increases as the square of the speed.

At 60 mph, therefore, a crack-up is four times as damaging as one at 30 mph. Dr. Hugh de Haven, who has done much crash injury research, advised them that at speeds under 40 mph the shock absorbent ability of normal aircraft structures is such that there is negligible risk of serious injury. But above 40 mph the risk factor increases very sharply.

The normal-type aircraft structure in the K-B design is, therefore, believed adequate to absorb all impact at slow speed. Koppen and Bollinger said that if no landing area was available a pilot could pancake his plane down at a very steep angle—with less rate of descent than a parachutist. The landing gear is being redesigned to take such a landing shock without breaking.

To reduce the hazard of fire aloft in the *Helioplane*, which is the one remaining possibility that could destroy the lift of the wing in flight, the wing and fuselage fabric covering is impregnated with a fireproof chemical.

In addition to its quite evident safety for the private pilot, the Koppen-Bollinger design is favorably looked upon by the military for its great potential value in liaison work. Military and CAA officials have indicated that they will cooperate in every way with the two professors.

Koppen and Bollinger said they intend to license the *Helioplane* for commercial manufacture when they are satisfied that it is adequately developed. They are investigating the possibility of incorporating some of their design features into current standard light aircraft by conversion to produce a performance similar to the *Helioplane*.

It is also the intention of the two designers to have a small number of *Helioplanes* built for trial use by selected agencies and possibly a few carefully selected private individuals who will take careful records of the aircraft's performance. The two professors hope the plane will be ready for commercial production within a year.

The *Helioplane*, Koppen and Bollinger have estimated, will in its inception cost approximately $500 more than comparable lightplanes fully equipped with variable pitch propeller and cross-wind landing gear. (Comparable lightplanes sell for $3,000.00.) They hope, however, that its increased safety and utility may help to generate a larger market. This, in turn, may be large enough to bring the price well below that of current planes.

JOHNSON BULLET is shown here in one of first flight shots of the new four-placer. Powered by 185-hp Lycoming engine, the *Bullet* cruises at about 185 mph and has a range of 550 miles. Feature of ship is jet exhaust arrangement

Eventually, the two plan to scale up their design into a four-place plane. Its price, they hope, when in volume production, may be comparable to a medium-priced automobile, or around $2500 or $3,000.

Dr. Bollinger, it may be recalled, stated one year ago in a special study of the fixed-base aircraft business published by the Harvard Business School, that there wasn't anything the matter with private flying that a good lightplane would not fix. In the study of 180 fixed-base operators over the nation, made in conjunction with another associate at Harvard, Arthur H. Tully, Jr., they specifically named lack of utility and lack of safety as factors in personal planes which were a major deterrent to growth of private aviation. They added these two major factors would have to be solved before the other deterrent—cost—could be eliminated by volume use.

Thus, they threw the book at the lightplane in a moment of what might be termed the industry's greatest complacency with its product. But it is more highly significant that as the lightplane's severest critic, Dr. Bollinger, has bounced back with an effort to develop a plane whose performance is, at least, bound to excite pilots.

Certainly one in the industry could holler "professor" at him with impunity since as a former airline pilot, flight instructor, fixed-base operator, and management consultant to several companies, Dr. Bollinger has had solid aviation experience.

It is also highly significant that the *Helioplane* has been produced solely by the efforts of these two professors and associates as a local effort in Greater Boston. They received no help from any great corporation or government aviation agency, and used their own money.

Four years ago Dr. Bollinger began toying with the idea of a lightplane with the performance characteristics of the *Helioplane*. After investigating many design ideas, he decided that Professor Koppen of M.I.T. had a concept that seemed most promising because of its simplicity.

Bollinger and Koppen later also became closely associated with the "noiseless" plane of the Aeronautical Research Foundation of Harvard, a project sponsored with NACA funds and the loan of aircraft, engines and equipment by various manufacturers. But the noise-reduction ideas and design features of the *Helioplane* has been demonstrated by NACA long before they ever joined talents in the Research Foundation. Professor Koppen, in fact, invented his "hush box" silencer, an ejector-type muffler for the late-lamented General *Skyfarer* personal plane.

Bollinger and Koppen had both long believed that little had been done to improve lightplanes in the last 20 years. Present personal planes they believe, take off and land at unnecessarily dangerous speeds. Thus, their minimum usable speeds force pilots to the use of larger fields and bar them the use of countless small emergency areas.

They believed a safe, slow-speed lightplane was feasible. They believed that the chief reason the average man was staying firmly on the ground was that the private plane was unsafe. Recent statistics by insurance companies disclose that commercial airlines are safer than riding in an automobile. But in the aviation field itself, private flying is far more hazardous.

Conventional planes, they knew, are too costly to operate. Repairs are expensive and for that reason hold planes on the ground a disproportionate amount of the time.

They discarded the helicopter as a near-term solution because Bollinger and Koppen believe it is many years from being a reliable, economical type of aircraft. The helicopter, in their opinion, is still too complex a mechanism, with a large number of moving parts subject to wear, metal fatigue, and getting out of adjustment.

The fixed-wing plane has only an engine and prop but the helicopter transmits power through gears into a rotor system which requires a constant change of pitch throughout its cycle and is hence continually subject to changing stresses and vibrations. Repairs and adjustments for helicopters are costly with a loss, too, of much operational time.

The helicopter, moreover, the two men believed, loses its airborne qualities immediately, in case of rotor blade failure, and drops like a plummet to earth. A typical four-place helicopter, furthermore,

(Continued on page 46)

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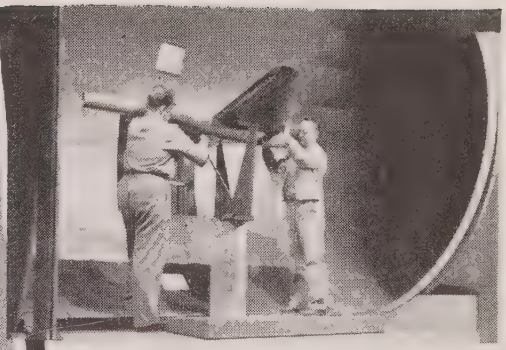

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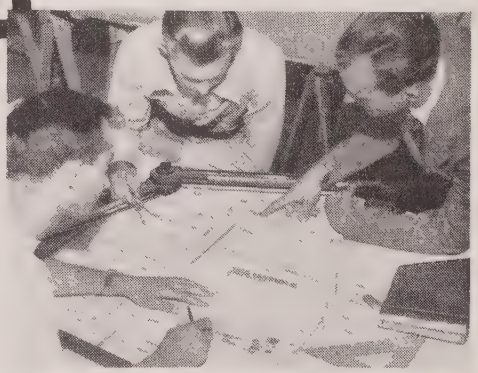

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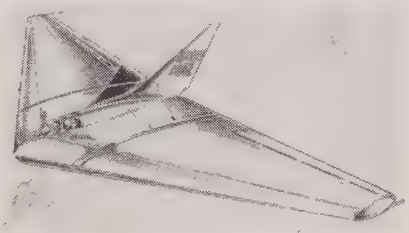

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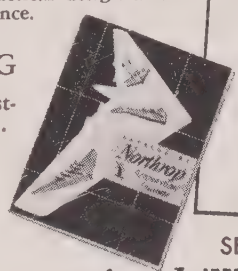

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Low and Slow

(Continued from page 44)

costs around $40,000. You can now buy a fixed-wing plane that will carry that many passengers—and faster—for as low as $2995.

A small plane may be rented, moreover, for about $9 an hour, whereas a helicopter rents locally for $100 an hour. A small plane can cruise comfortably at 90 to 120 mph whereas a typical helicopter can cruise at about 80 mph using over twice the horsepower for a given load.

The helicopter, Bollinger and Koppen realized, will be simplified, but they came to the conclusion that a plane with the ruggedness, simplicity, economy and safety of a fixed-wing aircraft was the only near-term answer.

For practical purposes the *Helioplane,* they believe, can do most of the things that a helicopter need do in everyday operation. CAA recommendations call for a 150-foot area for landing and take-off of helicopters. The Koppen-Bollinger design can do that.

The *Helioplane* is unable to hover, rise or land vertically, the two men know, but neither can the helicopter do this with the safety which the private pilot will demand. Vertical flight, they pointed out, is risky, and not a thing for the average pilot to play with.

Should engine failure occur at a 1,000-foot altitude, the K-B plane can glide two miles before it has to land, the two professors further pointed out. This means a circle of four miles diameter and, by squaring the radius this means a pilot has over 12 square miles in which to look around for a landing. The helicopter, by comparison, has a very sharp gliding angle when its power goes, they pointed out.

Bollinger and Koppen at first took their plane idea to various government agencies charged with the promotion of aviation. They went to the CAA, the NACA, and to the military.

At CAA, the project was taken to the top man—at that time, T. P. Wright. Though interested in the idea he could not take up the K-B design because Congress declined to give his department money for the development of light aircraft.

The NACA pointed out it was empowered to carry out pure research whereas constructing an airplane to the K-B design was applied research.

In the armed services the two men found any number of individual officers interested in their aircraft idea. But they were eventually told that they might save years of delay by seeking development funds elsewhere.

In the aircraft manufacturing industry the two professors found that development work was very expensive. For a large corporation to undertake their design research would have meant maintaining large groups of research technicians. This appeared mountainous beside the shoestring operation which Bollinger and Koppen eventually carried out on their own initiative.

They got nowhere then with lightplane manufacturers they approached at that time because the builders were still selling aircraft in large enough numbers so that they had considerable satisfaction with the existing product. The eventual slump in aircraft sales had not set in, so there was no backing there.

MIT'S professor Otto C. Koppen *(left)* goes over the *Helioplane's* split-rudder design with workman at Wiggins' hangar workshop

Bollinger and Koppen finally decided to do the job the way the industry had done it in the days when it was small.

In Norwood, some 15 miles southwest of Boston, the professors found a helping hand in E. W. Wiggins Airways, one of the largest fixed-base operators in New England. The Wiggins organization listened and agreed to put a roof over their heads. They were allowed to use some space in an unoccupied hangar.

Joseph Garside, president of Wiggins, made materials and parts available at cost and helped them in many ways to save expenses. The two men also found that Yankee workmen had not lost their willingness to take a risk. Several of them tossed in night and week-end work on a double-or-nothing basis.

At M.I.T. the two professors were able to secure the services of technicians who are available for specialized problems. In a measure, M.I.T. provided the technical resources which a large aircraft firm would have but without adding the huge permanent staff and overhead problems.

Bollinger and Koppen began at first entirely with their own money. Then as the design became a measurable probability, a few colleagues and friends were willing to help. Thus, the developmental steps became less of a shoestring operation. It is doubtful whether a large concern could have duplicated this developmental work for many times what it cost Bollinger and Koppen.

The top-flight engineers in most of the aircraft industry, Bollinger and Koppen found, were so engrossed in driving aircraft speeds up at the other end of the scale that they had little interest in the other end of the scale.

Even when two major aircraft companies had large military development contracts to develop small liaison aircraft with emphasis on short take-offs, they failed to meet the long-standing goal of ability to clear a five-story building in 300 feet from the start.

This is what Koppen and Bollinger have done.

Operation Jato

(Continued from page 33)

hadn't, his wheels might have caught in the soft sand and flipped him over on his back. Instead, with wheels up, he brought the ship in without much damage. The actuating arms on his inboard flaps were bent a bit from the belly landing, but that's about all.

As soon as Captain Whitaker and Lieutenant McManus saw that Blass had landed safely and that the plane was not badly damaged, they headed for the nearest airfield. Their own gas supply was getting low and neither pilot had any yen to duplicate Blass' feat. The boys radioed the info on Blass' landing to the Roosevelt Roads air strip at Puerto Rico where the Second Marine Air Wing was based for the maneuvers.

A few hours after the Sergeant's spectacular landing on the lonely beach in the Dominican Republic, the local military commander arrived on the scene. Upon official request, he placed a guard on the plane and took the Marine flyer to the nearby town of Azua, where Pilot Blass was put up at the one and only hotel.

On the following afternoon Major Everton, Captain Dan Johnson, a stunt pilot who flew at air shows with Lieutenant Colonel Marion Carl, and Master Sergeant D. A. Ives, another flying Sergeant on duty with the jet squadron, flew in from Roosevelt Roads to see what could be done about getting the FH-1 out and back to base. They landed at Ciudad Trujillo and went overland by jeep to the forced-landing spot. Escorting this group was Colonel George Stametz of the Dominican Air Force, a former Marine aviator who is now Director of the Dominican Air Force School. After a careful inspection of the entire area, the men decided the plane could be flown out with the help of JATO.

After ways and means of accomplishing this had been thoroughly discussed and decisions reached, Sergeants Blass and Ives remained at Trujillo while the rest of the party returned to Roosevelt Roads to round up men and equipment for the "getting-out" operation.

Because of the nature of the terrain, the men and most of the material had to be flown to Ciudad Trujillo and then hauled over the mountains for a distance of 121 kilometers. Some equipment, such as tool boxes, etc. was dropped to the downed plane from an R4D transport out of Roosevelt Roads.

While the two Sergeants were waiting for the men and equipment, they made friends around the town. Among these were two Canadian priests, Fathers Moriarty and Allen, who helped the food problem greatly by playing host on several occasions. According to Blass, the only restaurant in town was run by a Chinese gentleman who persisted in serving Oriental dishes, not always pleasant to the Occidental palates of either Blass or Ives.

A few days later, when the necessary help finally arrived, a temporary camp site was set up on the beach and 50 natives were put to work digging holes under the FH-1's retracted landing gear. The landing gear was then extended, a

ramp built up the front of each hole and the plane hauled up by the natives.

As the only JATO units available were not of the type used by the *Phantom*, other JATO bottles had to be flown in from Norfolk, Virginia to Roosevelt Roads where they were modified before being sent over to the beach at Trujillo. When they arrived, it was found they still didn't quite fit and so other stocks, or racks, had to be welded under the wings of the *Phantom* to hold the JATO units.

The welder was a native from one of the nearby plantations, and without his excellent help it's doubtful the job could have been done as well and as quickly.

After a careful inspection of the surrounding terrain, it was decided that a dry lake bed, a distance of some nine miles from the beach, was a better place for the take-off than the beach itself.

Local natives under the direction of Governor J. Koury of Azua Province labored tirelessly in getting the ground ready so that the FH-1 could be moved to the lake bed. With nothing more than machetes and crude tools, these people hacked and carved a path from the landing site to the spot chosen for the take-off. At the end of this path an area the size of a small airfield was cleared.

After the plane had been hauled to the take-off site, it was discovered that the jet engines would not turn over, even after all water had been drained from the fuel tanks. A hurried message to Roosevelt Roads brought a plane which dropped more tools and equipment. The downed *Phantom's* tanks were thoroughly cleaned and new governors and flaps installed.

Next came the JATO units. The bottles were set in the special adapters that had been built for them—and presto—the plane was ready for the take-off. Blass described his take-off this way:

"The hatch was open and, unfortunately, I'd left my goggles up. After turning the engines up to full rpm, I released the brakes. As soon as I started to roll, I cut loose with the JATO. Due to a slight miscalculation in thrust line, however, and with no weight in the nose, the tail skid was immediately driven downward and started scraping along the ground. Full forward stick didn't help any so the tail was still dragging when I left the ground. Fortunately, the elevators started to take right away and I was 'in.' By the time I came in to the field at Trujillo, I'd gotten most of the dirt out of my eyes, and felt darned happy it was over."

At Trujillo, the plane was given another thorough check, and later that day Blass flew on to Roosevelt Roads.

A glimpse into Sergeant Blass' Marine Corps career proves he isn't the stay-at-home type, and this experience on the beach in the Dominican Republic was just another tab in the old memory book.

"Shipping in" the Marine Corps in April of 1939, his first assignment with Aviation was with the Air Base detachment, Aircraft Two, at North Island, San Diego, California. Here he worked at the Assembly and Repair Section until the fall of 1941, when he was ordered to report to the Naval Air Station, Pensacola, Florida, for flight training. Graduating in April, 1942, he reported back to the West Coast and was assigned to duty aboard the aircraft carrier *Saratoga*. While aboard, he qualified in the famous Douglas *Dauntless*.

After qualification, he was assigned to the Marine Corps Air Station at Ewa, near Pearl Harbor, where he joined Marine Scout Bombing Squadron 231, the "Ace of Spades" outfit, and saw action in the early days of the Guadalcanal campaign. Here he was awarded the Distinguished Flying Cross and the Presidential Unit Citation. Blass was then transferred to El Toro, California and in July of 1943 was upped in rank to Warrant Officer. His next action was at Midway, and then at the Marshall Islands. It was during this period that Sergeant Blass was awarded the Air Medal.

Sergeant Blass was later transferred to the Naval Base at Yokosuka, Japan, where he joined Marine Fighter Squadron 461, and still later to Peiping, China, joining VMF-218. At that time he held the rank of First Lieutenant, the highest commissioned rank he held before reverting to enlisted rank in 1946.

During his career in the Corps, the Sergeant has flown planes ranging from the N2S trainer and the SBD *Dauntless* to the speedy Marine *Corsair* fighter and FH-1 *Phantom*, but this was his first go at a forced landing in a jet—and successful as it was, Blass does not long to try the trick again.

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Used Planes

(Continued from page 17)

sonal aviation depends on the presence in adequate amounts of the one tangible that makes the business world go 'round—cash—and a product that's worth the price tag that's placed on it.

The personal-plane manufacturing industry, aside from government regulations controlling the design of the product, is essentially a free enterprise; a wholly unlimited dealing between sellers and buyers, and the balance moves between them according to demand. The groundswell of complaint about obsolete designs, insufficient utility, government over-all regulation, high costs and the rest of it ultimately will have to be solved on the basis of the demand. If a man can't build a product that will economically compete for the public's dollars then he has to get out of business, a result that has been forced on several aircraft manufacturers since the war.

After a few aviation "spokesmen" had unsuccessfully pointed the accusing finger at everything else in the ceaseless search for the answer to the post-war aviation recession (over-optimism is rarely blamed), they finally indicted the used-plane market. "Too many planes available at too low a price," became their battle cry, with a convenient way of forgetting that only a short time before the complaint had been that aircraft were being priced too high. The used planes they were condemning were not pre-war or war-surplus types; most of them were only a year or two old.

Their logic is correct—a fairly new plane, not much different from a brand new one, if priced too low will ruin the market for the new one. The big *but* in the equation is the fact that no seller will take a loss unless he's forced to by the absence of cash at the price level he would like. He has to price the plane for the market. With that in mind, will the used-plane market, at whatever level it seeks, cripple new-plane sales?

W. T. Piper, president of Piper Aircraft Corporation, answering from the manufacturer's viewpoint, says, "One of the things that aviation needs more than anything else, as I see it, is a large number of low-priced airplanes which can be sold to people who will become prospects for new planes." Piper compares the future path of private aviation with the automobile industry sales pattern. "A boy bought an automobile for $50.00 and from that time on he was 'hooked' and it was impossible, so he thought, for him to live without an automobile. As his income increased, the amount he put into automobiles increased likewise . . . nothing can make aviation grow more rapidly than for a large number of used planes to be sold to owners who will get the 'bug' and learn how useful the airplane can be."

Floyd B. Simmen, general sales manager of Aeronca Aircraft Corporation, concurs, adding that "unless used airplanes are intelligently merchandised and placed in the hands of that segment of the market which desires the price advantage of used equipment, the sale of new airplanes will suffer." Simmen deplores the practice of some dealers who base their trade-in prices on the ones set by companies specializing in lien-seized forced-sale aircraft, which are far under the true market value of the aircraft and are only sold at those prices to satisfy a judgment.

A spokesman for the Ryan Aeronautical Company, builders of the *Navion*, explains the position of the higher priced aircraft manufacturers in almost the same way, emphasizing that "if our distributors and dealers are unable to sell used planes, they are not going to be able to make new-plane sales which involve a trade-in. We find, too, that nearly every distributor and dealer has four or five good prospects for *Navions* who are unable to afford the 1949 model, but have a standing order that whenever a good used *Navion* is obtained at a reasonably low price, they'll be in the market for one."

Since other manufacturers agree in substantially the same manner that there must be a brisk trade in used planes to support the market in new planes, what's the beef? The manufacturers have felt in the past as Floyd Simmen of Aeronca says, that used-plane prices are "based on no visible process of logic," and appeared to be based on passes at a Ouija board.

The stability that the builders would like to see seems to be coming along slowly but surely. A widely circulated aircraft sales newspaper had seven advertisements in a recent issue offering a well-known type of 1948 four-place all-metal plane for sale. According to the ads, all were beautiful bargains, never cracked, and appeared to be equally complete as far as de luxe equipment was concerned; ranging in flight time from low to high, prices set were: $4,450; $4,400; $4,650; $5,250; $3,900; $4,550, and $4,000. The highest priced plane of the lot was also equipped with cross-wind gear. Except for the two lowest priced planes, all were for sale in California, while the $3,900 job was in Utah and the $4,000 plane was available in Missouri.

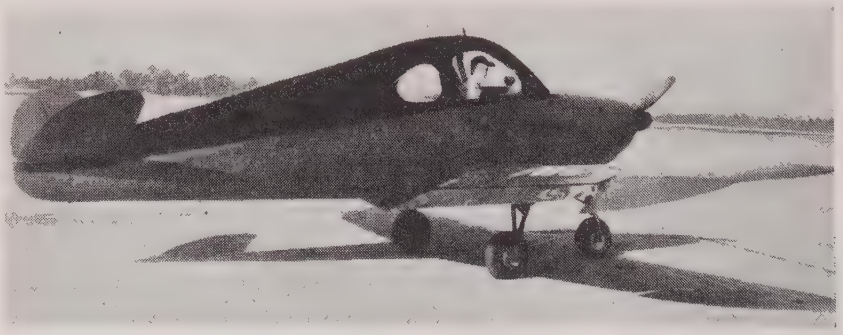
Excepting the cross-wind gear plane, the average asking price for the six planes was $4,325. According to a compilation of average market prices based on sales in 12 Eastern states provided for SKYWAYS by Powers & George, New York brokers, the average market selling price for the same plane in the East was $4,300, while the bid and asked prices had about the same price ranges as the price tags in the trade paper. These two sales averages from widely separated sections of the country seem to indicate that the day of the Ouija board is passing and used-plane prices, with good used aircraft present in a volume sufficient to stabilize the market, have begun to seek those required logical levels.

For the enlightenment of those who wonder how come perfectly sound aircraft are priced hundreds of dollars below their average market value, it might be best to point out that when an aircraft dealer has too many new planes on his hands and the bank or the guy who holds his mortgage demands payment on a stated date, in these days of not-so-prosperous aircraft sales the cash has to be raised in a hurry. The result is another plane thrown on the market with "ferry time only." Manufacturers who have become enraged at seeing blind ads or brokers' offerings of brand new planes at ridiculous prices might hold their tempers in check if they'd stop to realize that an aircraft operator who can get himself out of a hole by raising some cash in a hurry, even though at a loss, doesn't want to prejudice his future dealings with a manufacturer by letting him know that he has financial trouble and has to sacrifice the aircraft. But the condition is not so widespread that these prices become the norm for all airplanes of a particular type; usually being only once-in-a-while bargains. Sacrifice aircraft also come from pilot-owners who have over-reached themselves in buying new aircraft, or have to get rid of a plane because of an immediate need for cash for other purposes, or just plain want to sell and money is no object.

The list of used-plane prices (accompanying this article—page 17) from the records of Powers & George are not intended *under any circumstances* to act as a means for valuing used aircraft. These prices, like any other similar listing, are merely an *indication* of the price direction the traders are taking in the present market. All the prices are subject to that balancing law of how much the man is willing to pay and how much the other man is willing to take for his airplane.

Beyond the problem of price in the used-plane market there is another important question. How is the buyer to determine whether a used-plane offering is

(Continued on page 62)



NEW CONTENDER in personal-plane field is the three-place, all-metal *Jupiter*, developed by Jamieson Aircraft at Deland, Florida. It is powered by 115-hp Lycoming, cruises at 150 mph. Company plans to put it on market for $2,500

Pilot's Report . . . Mooney Mite

(Continued from page 22)

up the engine. There is no starter and the ship is as difficult to crank as an *Ercoupe* because the prop hub is so low to the ground. Inside the cockpit there is plenty of room for a six-footer even though the only adjustments in the seat are made by re-distributing the cushions.

Visibility in taxiing is wonderful—though it seems unusual to be sitting so close to the ground. Even with its small 400x4 tires, built originally for wheel-barrows and adapted to the Mooney to cut-down costs, the ship had no tendency to bog-down on the sandy taxiways. Since the weight empty of the Mooney is only 500 pounds, our total take-off weight was roughly 725 pounds, including a full tank of 12 gallons of gas. The gas tank, incidentally, is mounted high in the fuselage—just aft of the pilot's head. No fuel pump is needed since gas will feed by gravity in any normal flight attitude.

The weather was hot enough—about 90° on the ground—so that no lengthy engine run-up was needed. After checking the mags with two toggle switches at the far right side of the cockpit, we tried the carburetor heat control directly below the tachometer. There would be little chance of carburetor icing here, but it is a long-established habit. The ship also has a cabin heater that was not used on this flight.

Even on this hot, sandy 2200-foot high airport, the Mooney hopped into the air in the length of a football field. Take-off is easy. There is little torque to worry about with the tricycle gear but we were cautioned by Mr. Bontempt not to "horse" the ship into the air before it really wanted to fly.

The control touch in the air is almost identical with the old Culver *Cadet*. Only the slightest movement of the controls brings an instant response from the Mooney. You don't actually move the controls, you just think about it! After over-controlling the ailerons in the gusty air close to the ground, we let go our heavy-handed grip on the control stick and flew it with finger-tip pressures. Don't get the idea that the ship is "hot" or touchy to fly. It just handles easily with minimum stick pressures and qualifies well as a "lazy" pilot's airplane.

Getting the gear up is an interesting experiment. Since it was our first hop in this single-seater, we climbed at a conservative 70 mph until we had about 400 feet before reaching down for the hand-brake handle of the landing gear. It takes quite a little pressure to unlock the gear. However, once it is disengaged, the handle swings back easily until it is three or four inches short of the up-and-locked position. Then the pilot must apply considerable pressure to force the gear-handle back into the fully-retracted lock. A lightweight gal pilot might find considerable difficulty in locking this gear, but if the pilot has normal strength in his arms, the whole arrangement is very neat. There should be little or no maintenance on this one pilot-power retracting gear. It is, to this pilot's way of thinking, the fastest retracting gear yet put on an airplane once you "get the hang" of the lever control. In watching Mr. Bontempt fly the ship later for demonstrations, the pilot was able to get the gear up and locked within seconds after the Mooney broke ground.

Since the Mooney is noted for its high-climbing characteristics, we decided to see how long it would take to climb 10,000 feet. The Mooney is available with two different propellers, one pitched for fast take-off and rapid climb and the other for more efficient cruising speeds. N353A was fitted with a cruising prop, the air was hot and bumpy, so we didn't expect too much in the climb department.

With full throttle, it took exactly 14 minutes to climb from the 2200-foot-high Sky Corral to 12,200 feet. Airspeed was held between 65 and 70 mph.

The angle of climb of this little Mooney is so steep that visibility is partially restricted with the nose up in a full-throttle climb. We found it necessary to make a few shallow turns while going up to see what was out ahead of us. Later, we loosened the safety belt and doubled one of the cushions in the seat so that our head just cleared the hatch and visibility improved greatly.

A placard on the instrument panel *(Continued on page 52)*

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TRAIN IN MIAMI--AIR CAPITAL OF THE WORLD

Watch the Weather

(Continued from page 19)

Even if you're not flying—and if you don't have easy access to a weather station—watch the fronts and the air masses go by your town. Watch weather as it grows in the sky. Sometimes local newspapers publish weather maps that will help you.

Take a warm front, for instance.

First you see the approach of high clouds, cirrus stratus, followed by alto stratus. Mechanically you can register that this means the approach of a warm front, and let it go at that. But if you can visualize that the high clouds really indicate a huge mass of warm air, pushed upward as it collides with and overruns a colder air mass—the warm, moist air distilling out its moisture in the form of high clouds—you will better understand what's happening.

Then, with the further advance of the front, the lower clouds—the strato cumulus deck—move in, followed by stratus and the beginning of precipitation. It's important to know these various cloud formations, but it's even more important to recognize that what is happening is as simple as what happens when you blow your breath against a cold mirror. The warm air which can absorb more moisture than cold air is being cooled, and the moisture has to have some place to go. In the case of the warm front, it's rain or fog, in the case of you and the mirror, it's mist on the glass.

You know that warm fronts mean widespread precipitation with ceilings and visibilities frequently down to instrument or near instrument conditions. After recognizing the approach of the front, watch for the bad weather to check your own forecasts.

On the days when you never even get near an airport, you can still watch the clouds roll by. If you do it long enough, you'll begin to live with the weather. Weather to me is like the sea. When you're flying, you're in the middle of an air mass, just like a ship is in the middle of an ocean. Everything that happens to it, happens to you. And speaking of watching the clouds, Lou Landau, flight forecaster at La Guardia Field in New York, has told me of several sea captains who predict weather by cloud watching alone—and they're accurate forecasts, too—so much so that other mechanical means of predicting weather are almost of secondary importance to them.

I personally like to know what's pushing me around when I'm part of this air mass. So, I watch for every sign. When I look down and see the smoke from a chimney bent down flat with the wind, I know that wind's working on me too. And then when I go through some stuff and see the bloomers on a Monday wash line blowing another direction, I know I've been through a frontal area of some sort, and I've got to change my heading.

The more you watch for things like that in flight—and on the ground—the more your conversations with weather men will take on meaning. Reason is you've already got ideas about what's happening to the weather, and the forecaster knows he's not starting from scratch when he talks to you.

When you have to talk to the forecaster on the phone, try a procedure I've developed over a period of time, and see if it doesn't help you get the most out of a call. Tell the forecaster:

1. Your name (he has to have it for his log and you'll save some time if you start off with it).

2. The type of plane you're flying (so he can visualize immediately how far you're likely to be going, and what altitudes you can use).

3. Your estimated time of departure (so he can formulate his answers immediately in regard to the time you want to leave).

4. Then ask for weather reports en route, and terminal forecasts.

5. After you get the specific reports, ask what the weather map looks like in general. (If there's a front in the area, for instance, ask how it lies so you can plan to go under it at right angles, and thereby get beyond it as quickly as possible).

6. Ask for advice on altitudes to fly, considering icing, turbulence, etc.

7. Get the winds aloft for the altitude recommended.

8. Then, before you hang up, get clear in your mind just how well the forecaster thinks the forecast will stand up. In some cases, he will know that major changes from the forecast are impossible. In others he will indicate that he can't be too sure, and may suggest a time at which you should check again en route, or on the ground, in order to know for sure. Also check to see what he says about local conditions en route affecting the forecast—orographic effects due to terrain for instance. Or possible wind deflections over mountains, turbulence of heated deserts, low fogs over cool lakes, etc.

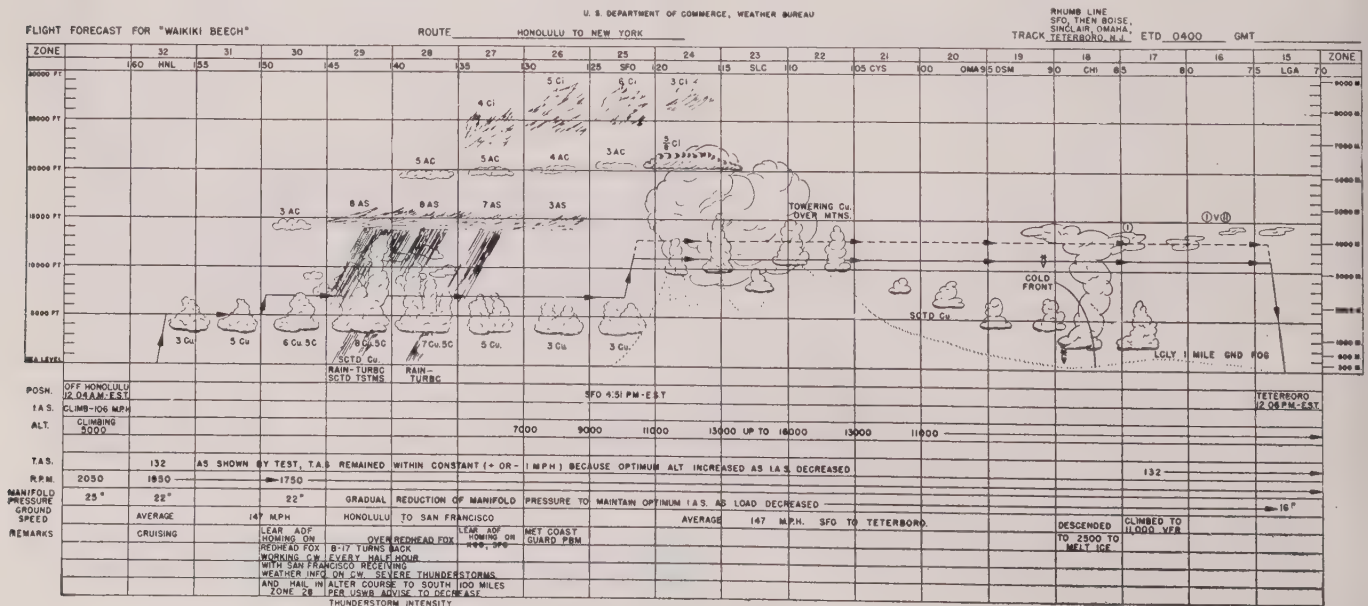
As you piece together information, you'll pick up a "rule of thumb" here and there. Take freezing rain as an example. Contrary to logic, or so it would seem, freezing rain is a phenomenon of a warm front.

Why?

Well, visualize again, warm air overrunning a wedge of cold air near the ground. As the warm air cools, it precipitates. With the cloud ceilings usually low at this point, the moisture does not have far to fall, and it may not have time to freeze—unless it strikes an object that is of below-freezing temperature itself. That's your airplane—assuming of course, that you're traveling in an air mass cooler than freezing.

The rule? Watch for freezing rain when you're headed into a warm front from areas where temperatures are below freezing. Have some intermediate fields picked out.

I know a pilot who not long ago flew the last few miles to an airport with his head stuck out the window because his windshield had frozen up on him. He wasn't nearly as concerned about his cold head as he was in watching a layer of ice accumulate on the wings. He was a happy man to get his feet on the ground. He said later, that if he had known how freezing rain came about, he wouldn't have been caught with his face hanging out. He knew he was in a cold area—and it didn't take a thermometer to show him—and he knew there was a warm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FLIGHT FORECAST FOR "WAIKIKI BEECH"
ROUTE HONOLULU TO NEW YORK
TRACK RHUMB LINE SFO, THEN BOISE, SINCLAIR, OMAHA, TETERBORO, N.J. ETD 0400 GMT
ZONE
160 HNL 155 150 145 140 135 130 125 SFO 120 115 SLC 110 105 CYS 100 OMA 95 OSM 90 CHI 85 80 75 LGA 70
ZONE
32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15
20000 FT
10000 FT
5000 FT
SEA LEVEL
4 Ci
5 Ci
6 Ci
3 Ci
5 AC
4 AC
3 AC
8 AS
7 AS
3 AS
TOWERING Cu. OVER MTNS.
COLD FRONT
SCTD Cu
3 Cu
5 Cu
6 Cu
8 Cu SC
SCTD Cu.
RAIN-TURBC SCTD TSTMS
7 Cu SC
RAIN-TURBC
5 Cu.
3 Cu.
LGLY 1 MILE GND FOG
POSN.
OFF HONOLULU 12.04 A.M. EST
SFO 4:51 PM-EST
TETERBORO 12.08 PM-EST
T.A.S.
CLIMB-106 M.P.H.
ALT.
CLIMBING 5000
7000 9000 11000 13000 UP TO 16000 13000 11000
T.A.S.
132
AS SHOWN BY TEST, T.A.S. REMAINED WITHIN CONSTANT (+ OR- 1 MPH) BECAUSE OPTIMUM ALT INCREASED AS I.A.S. DECREASED
132
R.P.M.
2050
1950
1750
MANIFOLD PRESSURE
25"
22"
GRADUAL REDUCTION OF MANIFOLD PRESSURE TO MAINTAIN OPTIMUM I.A.S. AS LOAD DECREASED
16"
GROUND SPEED
AVERAGE
147 M.P.H.
HONOLULU TO SAN FRANCISCO
AVERAGE 147 M.P.H. SFO TO TETERBORO
REMARKS
CRUISING
LEAR ADF HOMING ON REDHEAD FOX
OVER REDHEAD FOX B-17 TURNS BACK WORKING CW EVERY HALF HOUR WITH SAN FRANCISCO RECEIVING WEATHER INFO ON CW. SEVERE THUNDERSTORMS AND HAIL IN ZONE 28 ALTER COURSE TO SOUTH 100 MILES PER USWB ADVISE TO DECREASE
LEAR ADF HOMING ON [illegible]
MET COAST GUARD FBM
DESCENDED TO 2500 TO MELT ICE
CLIMBED TO 11,000 VFR
THUNDERSTORM INTENSITY

ont ahead. He expected low clouds—
ad got them, but it hadn't occurred to
im that as he flew out of the cold areas
nto a warm area, his real danger would
e freezing rain.

Another rule of thumb comes from "fair
eather cumulus" clouds, the billowing
asy-going broken cumulus clouds with
nly slight tops. Unaccompanied by other
louds, they form in the middle of a
igh-pressure zone. The predominate
eather activity causing the clouds is
onvectional instability in which the warm
ir rises from the earth due to the warm-
ng effect of the sun and condenses into
louds at colder altitudes.

The rule? The presence of these clouds
uarantees good weather certainly as far
s the horizon and probably up to 100
niles.

Next to the forecaster, your best com-
anion in the study of weather is an
ircraft-type portable radio that brings in
ange frequencies as well as standard
roadcast.

Suppose you're in a strange town where
here is no weather station. Take the radio
o your hotel room and before you go to
ed get the latest report and forecasts.
The major range stations issue a two-hour
orecast periodically, following the regu-
ar station reports.) Then set the alarm
o hear an early morning forecast, say at
6 a. m., make a mental note of it, turn
ver and go back to sleep. When you're
eady to get up, turn on the radio again,
heck the latest reports. By this time,
ou have a pretty good idea of the gen-
ral situation and you can make a
ecision. If the weather's good, beyond
loubt, you can get up and go. If you
ave doubts, you'll know that a phone
all to a forecaster is in order. Of course
f you have two-way radio you can leave
nyway, and make contact by radio. But
acking two-way radio—even with it—
personal call to the forecaster is a good
dea. There are few places in the United
States where you can't find out what
ou need to know for a 50-cent phone bill.
t's worth it. When you do talk to the
orecaster, your prior listening to reports
will help the new information make sense.
Between report times, you've always got
nusic and news.

Any cross-country trip, I figure, should
t least include some kind of radio
eceiver. I'm a great believer in radio
myself, and fortunately have my own
Beech *Bonanza* equipped with all kinds
f gear. But if you can't afford anything
lse, you should at least get a portable.

If you do fly without radio, don't get
aught in anything less than a 1,000-foot
eiling and three miles visibility. If it's
hat bad, it can get worse before you get
o where you're going—and without radio,
ou'll never know what it's like at your
erminal. Visibility is even more important
o watch than the ceiling. When the visi-
ility gets shorter than three miles, it
neans a quick shift to zero-zero is
ossible. The ceiling can, on the other
nand, get under the 1,000-foot mark and
till not restrict visibility for miles ahead.

Although I stress the use of radio, I'm
he first to admit that radio can break
own, and anyone relying on it entirely
as a chance of finding himself in a
eculiar situation one day. When break-
downs do occur, your background in weather is a handy thing to have.

By way of example, there's the story of Tibet. It wasn't radio that went out in this case—it was the isobars—but let me explain.

A couple of years ago I was flying for Milton Reynolds in China on an expedition Reynolds was subsidizing to search for a legendary mountain higher than Everest. Somehow everything in China got snafued beautifully. Red tape, governmental intervention, suspicion, strange and peculiar maintenance problems, all contributed to a decision to abandon the mountain searching attempt. But we had an airplane and our problem was to get it out of China even though still grounded by red tape and without permission to leave.

I knew India pretty well from having flown the Hump commercially just following the war. So, we decided to head for Calcutta—over Tibet. We'd just take off for India without letting anybody know, red tape or not. Well, Tibet is not only the end of civilization, but is also the end of the isobars. The weather maps in the Chinese weather offices ran out of information when it came to that part of the country, and the isobars, indicating pressure zones, just straggled off into nothing. I didn't dare ask any direct questions about Tibet for fear of tipping off somebody that we were planning a getaway. The map showed, however, a high-pressure zone and good weather for almost all of China, and by guessing how the isobars would continue into Tibet, I figured there would be good weather there, too.

So, on the day in question, we piled into the C-87 parked at an airfield in China, and took off for the Forbidden Country. For miles over China, visibility was so restricted because of dust storms and haze that we couldn't see what was coming ahead. Finally we picked up high clouds above us. Then lower clouds, precipitation and snow. It was soon obvious we were headed into a beautiful warm front.

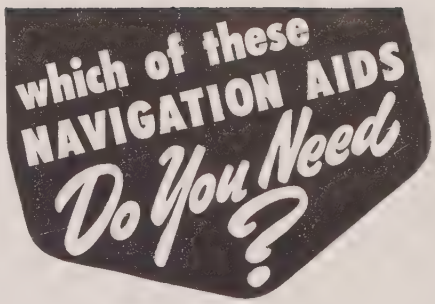
I climbed to 25,000 feet to get out of it. We began to take on ice and the old C-87 wouldn't go any higher. The solid stuff was still above us, there was more ice ahead of us, and I knew there were mountains beginning to reach up from below. We had one choice—to get the Hell out of there—quick.

Hours later, we landed at Shanghai. (Here we eventually went through the whole process all over again, finally skipping out by way of Japan.)

As I look back at it now, I realize how important it was for me to have a good groundwork in weather. If I hadn't been able to recognize the weather we were in, isobars or no isobars, and if I hadn't known what a warm front meant and how extensive it could be, we might have tried to go through it.

And there's good chance that maybe that mountain we were looking for would have reached a big paw up through that soup to whack the bejeepers out of the lot of us. +++

This is the second in a series of articles by Capt. Bill Odom. Next month—Plane Performance.—Ed.



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. . . Mooney Mite

(Continued from page 49)

says "Do not open hatch in flight above an IAS (Indicated Air Speed) of 109 mph." Since it was hot and stuffy on the ground, we cracked the hatch back one notch—about two inches—just as soon as we settled down and began to feel at home in the little ship. This is the only source of fresh air in the Mooney.

At 10,000 feet above Las Vegas, the blue water of nearby Lake Mead stands out in the sharpest contrast against the sand-and-sagebrush of the desert. Bright green lawns of the swank resort hotels dot the main highway west of town and you can see for 50 miles in any direction through the clear desert air.

No attempt has been made to muffle the Lycoming engine and the little ship is quite noisy with the hatch partially opened. This was the only time during our stay in Las Vegas that it was not possible to hear the hungry tinkle of Nevada's endless slot machines.

After checking the 10,000-foot climb of the Mooney, we had plenty of altitude to try out the stalling characteristics. At the top of our climb we pulled back on the stick with full throttle until the ship shuddered and stalled. The indicated airspeed was 40 mph. There is plenty of warning by stick buffeting before the Mooney stalls and the pay-off is not at all violent.

With gear and flaps down, the stall is slightly more abrupt but not at all vicious. High-speed stalls out of turns with excessive back stick give the same ample warning. First you feel the vibration of the stall through your fingers on the stick. Then, as it becomes more pronounced, the whole airplane buffets. We tried to force the little ship off into a spin and found that it took full back stick and full rudder to make it pay off. The slightest relaxation of back pressure puts the Mooney right back flying again. Without a parachute, these spin tests were restricted merely to a spin entry followed by an immediate pull-out.

Small triangular stall strips near the fuselage help make the root of the wing stall first so that the ship has full aileron control down to its slowest flying speed.

Either the airspeed was slow on N353A or we didn't have the mixture control leaned out properly for full power. In level flight with full throttle, we were able to indicate only 93 mph at 12,200 feet. That calibrates out roughly at 115 mph. Since there are no mile-apart section lines near Las Vegas, we were unable to make an accurate check. Flown by a pilot completely familiar with the Mooney, the performance would undoubtedly have been better. I've had it on good authority that the Mooney whips along at a nice 115 mph at half throttle. Mr. Bontempt advised us that he flew this same plane to Las Vegas from Clover Field in Santa Monica in loose formation with a loaded Stinson flown at cruising power.

Since it was cool and comfortable at higher altitudes, we stayed at 10,000 feet and did a series of steep "Lazy 8's" to get the feel of the airplane. The airspeed on this maneuver ranged from 40 to 110 mph. Nose down, the Mooney's clean design makes it pick up speed very rapidly. Yet it handles smoothly with plenty of control remaining at the minimum speed on top of the "8."

This flying high and on your own is really quite a novelty. With the exception of military pursuit pilots, very few flyers have logged any time in single-seat equipment. There are absolutely no distractions; no instructor to ask questions of, no passengers with whom to jabber and no radio to talk over. This lonesome feeling gives a pilot that seldom-realized opportunity to grasp that vasteness and magnitude of the sky that each student feels when he first solos.

Reluctantly we let-down into the hot, bumpy layer of air that hovered over Las Vegas. We circled the town and decided to shoot a landing at the Sky Haven Airport northwest of town. Their 4800-foot runway is merely a strip graded out of the desert and soft spots were in evidence from a recent rain.

As we circled the airport, a popular four-placer took off. With the soft runway and the hot midday air, the ship took a very long roll before breaking ground. But it was not so with the Mooney.

We found that the easiest way to lower the landing gear was to slow the ship up to about 70 mph, unlock the landing gear lever and let the gear fall to a half-way down position. Here the wind against the nose-wheel seems to stop the gear. On our first try, we high-pressured the landing gear handle into the down-and-locked position with our right hand and took some skin off our wrist. The next try was made by dropping the gear into this "floating" mid-point position and then standing on the "brake" handle with our right foot. Pressure is easier to apply this way and the little ship flies perfectly well without touching the rudder pedals.

The Mooney has one of the neatest little gadgets to check the landing gear for down-and-locked that has yet been put on an airplane. You can't see either the nose wheel or the main gear from the cockpit, so some sort of a warning gadget must be used to remind the pilot in case he's forgotten to drop his gear.

The Mooney uses a little red dot, about the size of a 50-cent piece, on the end of a six-inch rod. If the gear is not down and locked, this gadget wig-wags like a child's metronome as the throttle is brought back beyond 1200 or 1400 rpm's. The gadget is driven directly from the intake manifold, just like a vacuum windshield wiper on a car. There are no electrical contacts, no red lights or buzzers to burn out. When the engine output is cut below 1200 rpm, the wig-wag goes into action. While a pilot might miss the noise of a horn or the blink of a light, it would be mighty difficult for him to ignore a red-dot flopping back and forth in front of his face.

As in any strange airplane, we came in on the fast side for our initial landing. The airspeed held an indicated 70 mph as we crossed the fence and eased down close to the ground. Then we floated . . . and floated . . . as we kept the little airplane in the air as long as possible. With the stick all the way back, she quit flying at 45 mph and barely touched the stub of a tail-skid in the sand as we landed.

The little wheel-barrow tire didn't dig into the sand even though we used full brake and skidded the main wheels. The Mooney ground to a stop in less than 250 feet.

The Mooney does not turn as short a circle on the ground as many tricycle-geared planes so you must plan ahead a little while taxiing.

By now it was so hot on the ground that we opened the hatch all the way and left it there. Since there was no one available to ask whether or not you flew the Mooney with the hatch fully opened, we ran up the engine and decided to try it.

Our take-off roll from the Sky Haven

Piper Sprayer

Popular crop-spraying airplane is the Piper 90, shown here in action. The ship carries 47 gallons of liquid spray in a streamlined tank under its fuselage. Wind-driven pumps force the spray out of 12 nozzles mounted on "racks" under each wing. The spraying equipment on the *Cub*, developed and manufactured by A. W. Whitaker of Portland, Oregon, occupies no cabin space.

took up less than half the runway used by the previous four-placer. We hopped the little ship off the ground and had the gear tucked away before we were over the end of the runway.

With the hatch open, the Mooney is naturally quite windy. All the dust and dirt that had accumulated while the ship was tied down the night before floated up around our eyes and out of the cockpit. There seemed to be no bad-handling characteristics with the hatch open and the landing speeds were unchanged. With the short exhaust stacks barking less than three feet from your left ear, however, it was quite noisy.

There is a forward suction around the canopy in flight. When we experimented with closing the hatch in flight, it picked up speed as it moved forward and slammed rather hard into the windshield stops.

Since we had been in the air nearly an hour, we looked back at the visual gas gauge. We had burned less than three gallons of gas!

We flew around town lazily and shot a couple of more landings at the Sky Corral before making a final landing at the airline terminal, McCarren Field. We flew a square-cornered traffic pattern, dropped the gear on the downwind leg and finally picked up a green light from the tower as the little Mooney rolled out on its base leg. Without even a radio receiver, flying into an airline terminal can be a little difficult. N353A had been released from the factory licensed only for daylight flights and was equipped neither with generator nor lights. Testing is now underway at the factory for an inexpensive belt-driven generator. Everything on the Mooney, with the exception of the engine, propeller, instruments and tires, is made at the Mooney factory in Wichita, Kansas.

While taxiing in from the huge runway at McCarren Field, we passed actor Jimmy Stewart's "Thunderbird," the souped-up F-51 that is the current transcontinental record holder. The racer had been flown in for display purposes by pilot Joe DeBona.

Actually, the F-51 and the Mooney have a good many things in common—though speed is not one of them. They both have plenty of power for the size of the airplane. Both carry only a pilot and very little else. Both are full-cantilever, low-winged ships with retractable gear and both climb like an Angel late for a date.

One interesting side-light on the Mooney is the method of checking out pilots in it. Prominently displayed on the bulletin board in Harry Royster's office at Clover Field is the following statement:

"A pilot must have at least a private license.

"A pilot must have made at least five take-offs and landings within the past 60 days.

"A pilot must have logged at least 50 hours in aircraft of 90 hp or less.

"For any pilot who has never flown a Mooney, there must be a check ride in a aircraft of 90 hp or less prior to the first flight in the Mooney."

For a sportsman pilot who likes to hunt and fish alone in the most inaccessable of high-altitude spots, the Mooney would be ideal. It should prove a good salesman's ship since it will get in and out of relatively unimproved airports with ease, but the flying salesman must be able to put his order book and clean shirts in the 40-pound baggage compartment located directly behind the seat and accessable only by pulling the back of the seat forward.

The Mooney would be very practical for a large flying school for confidence-building cross-country trips since its operating costs are so reasonable. Factory tests have shown that the Mooney will fly 100 miles on from 73 cents to 84 cents worth of gas and oil.

If you really love the wild blue yonder and want to get away from the rat-race of constant contact with other people, the Mooney is an excellent vehicle. For small, high-altitude fields where the average ship puffs and groans, the Mooney is in its element. And for the Scottish pilot who frets about his gas and oil bills at the end of each month, the Mooney is hard to beat.

If you can fly alone and love it, be sure to try the new Mooney.

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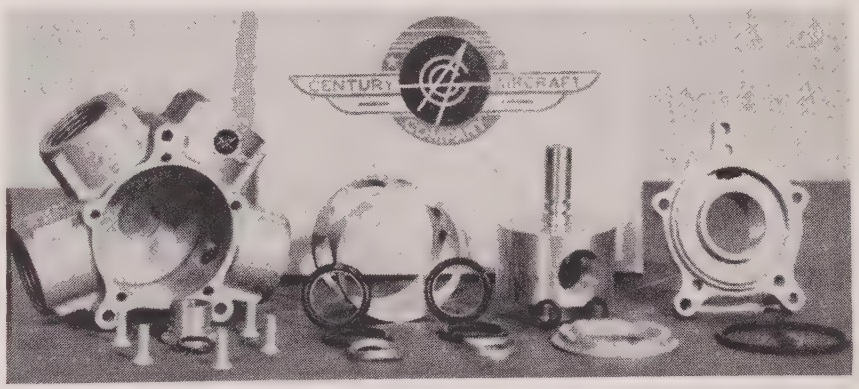

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Aero Bird Dog

(Continued from page 27)

The frequencies 100 to 200 kilocycles, 400 to 550 kilocycles and 1500 to 1750 kilocycles will seldom if ever be used by a pilot. A manual tuning crank is located just below the band-change switch.

Continuing across the top of the control panel from left to right we find a light adjustment rheostat which needs no explanation and an electric meter marked "Tune for Maximum." This meter is a visual aid to tuning by ear. It will indicate a maximum deflection when any station is properly tuned in. It serves the same purpose as the "seeing-eye" on many home broadcast receivers.

A knob marked "Audio" at the right center of the control panel is the volume control. A panel light is just below and to the left of the audio knob, and spare bulbs are to the right of this volume control.

Immediately to the right of the spare bulbs is the loop switch. This switch operates a two-speed electric motor which rotates the loop antenna left or right. Apply pressure and turn the loop switch for fast rotation. Just turn it left or right without pressure for slow speed.

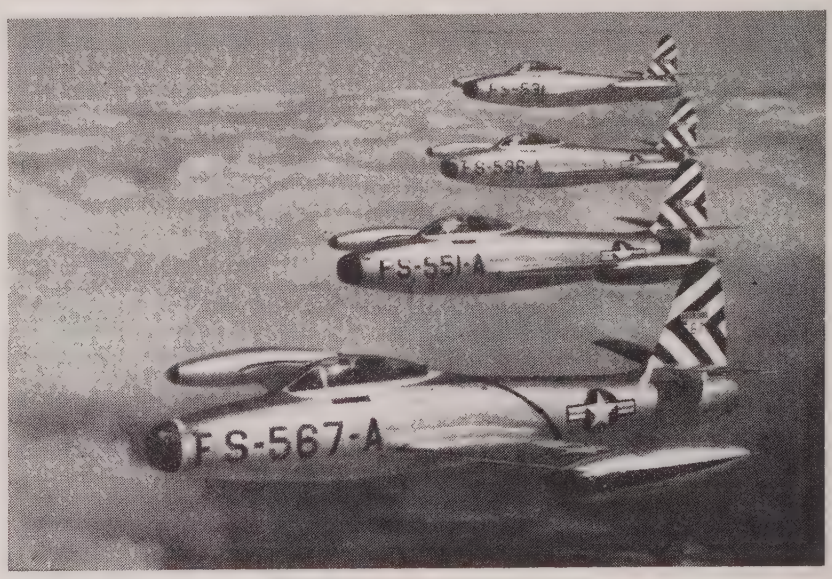
To get the utmost in operating satisfaction from your ADF receiver, it is absolutely necessary to understand the intricate function of the switch labeled "Off-Compass-Antenna-Loop." This is a multi-purpose switch that turns the set on and off, selects the proper antennas and changes from AVC (automatic volume control) to MVC (manual volume control), all in one operation. The radio-compass receiver installation includes two antennas, a whip and a loop. (In the new NA-1, it's the Iron Core Loop. The compass position on this switch uses both antennas and automatic volume control making the receiver operate as an automatic direction finder.

The antenna switch setting uses only the whip antenna and MVC, making the set operate as a standard range or broadcast receiver. This position should always be used for initially identifying the correct station. The loop position, using only the loop antenna and MVC, allows the set to be used for homing and tuning aural nulls. By the way, the loop position also makes a fine anti-static antenna.

The control button at the lower right edge of the panel was originally put there for changing the control position of the ADF from navigator to pilot or radio operator in large army aircraft installations. When only one control panel is installed, this button is not utilized.

Now let's take a look at the receiver itself. A 15-tube superheterodyne, the radio compass set in addition to its direction-finding qualities makes a fine extra radio-range receiver.

Only three controls on the set itself are of interest to a pilot. The auto-sense controls adjust the signal to noise ratio of the receiver and the dampening action of the compass needle. Both screw driver adjustments, they are set for correct performance by the radio mechanic who installs the equipment. If the compass needle oscillates excessively or not sufficiently, or if background noises seem to over-ride a weak range signal, have an aircraft technician check the setting of the auto-sense adjustments.



FORMATION FLYING, jet style, is demonstrated here by pilots of the 14th Fighter Group at Dow Air Force Base, Maine. The 14th Fighter Group was one of the first to be equipped with F-84 jet fighters and already has accumulated more than 13,500 hours. The photo above was made by Capt. John T. Nelson. Capt. Nelson made picture with Fairchild K-20 aerial camera from another F-84

A switch marked "CW-Voice" may be located on either the receiver or the control panel, depending on the model ADF you own. On the Bendix NA-1, the CW switch is on the Remote Control panel. Normally, it will be set at "Voice" and left alone. The CW is usually used in taking aural null loop bearings.

An azimuth scale called the "Radio Compass Indicator" is installed in the pilot's compartment together with the control panel. This indicator or radio-compass needle points to the station being received and gives the bearing from your present heading in degrees.

The balance of the equipment included in the radio-compass installation is a loop antenna, a sense or whip antenna, tuning and connecting cables, a dehydrator (glass tubes filled with moisture absorbing crystals) and an inverter for changing the electric current for the receiver to 110 volts, AC.

The Iron Core Loop that is part of the NA-1 system is encased and sealed in glass, all of which eliminates the need for a dehydrator. Thus, the Iron Core Loop reduces maintenance, and in addition results in six or eight times less drag on the airplane.

Now that we are familiar with the set and its component parts and controls, here is the correct step-by-step tuning procedure for the ADF receiver.

1. Turn "Compass - Antenna - Loop" switch to "Antenna" position.
2. Turn on inverter 110-volt current for the ADF, (usually a separate piece of equipment).
3. Select band of frequencies desired and use manual crank to tune in desired station.
4. When broadcast or range station is identified, change switch to Compass position and the indicator needle will point to the station to which you are tuned.

You now have a compass that will point to a radio station as accurately as your magnetic compass points to the north pole. No longer is it necessary for you to take the long way 'round and fly airways just because a range leg happens to run that way. Draw a straight line on your map, and then fly that line. When you do fly along an airway, on the beam, the ADF can be used as an auxiliary check to point the way. When you pass directly over the station tuned in on a radio compass receiver, the indicator needle will oscillate violently and then swing 180° and point back to the station you just passed.

This can serve as an auxiliary check to the cone of silence you hear in your phones. Remember—if you want to use the compass set as a regular range receiver to ride a range leg, it is necessary to switch to "Antenna" and manual volume control.

Like almost all mechanical pieces of equipment the ADF has some shortcomings. If you are familiar with these faults, they are readily recognized.

A few years ago I made a delivery flight in a B-26 from a factory near Baltimore, Maryland to a modification center at Omaha, Nebraska. I had a new co-pilot who said he understood the operation of the radio compass receiver. He did, so long as everything functioned normally, but on this flight things were not normal. We received an ATC clearance to cruise at 500 feet on top of a solid overcast and planned to make a gas stop at Chanute Field, near Rantoul in east central Illinois. Nelson did the flying and wisely dodged around the tops of many thunderheads. He evidently was not aware that an ADF will point to a thunderstorm if the electric crashes it sends out are stronger than the signals of the station to which you are tuned. I watched the ADF needle swing first right, then left, then straight ahead. When it is functioning normally and the received

gnal is strong, the needle remains fairly eady in its point. Now, however, it was eking, first the station, then one thunder- orm, then another, all over the place. I lanced at Nelson and then at our magnetic ompass heading. He was flying almost due est. A strong south wind had been ported aloft and I figured we might be rifting north of course. I switched over to Antenna" position and identified the hanute range signals. Then I changed ver to "Loop" position and took an aural ull on the Chanute radio range. There is o possibility of any thunderstorm affecting n aural null. It is purely a mechanical earing. The needle turns only when otated together with the loop antenna by he loop left-right switch.

The needle always points to the hole or ull (minimum signal position). Increasing he volume and placing the "CW-Voice" witch in the CW position will serve to arrow the width of a null.

My bearing on Chanute field showed we were somewhat north of course, but I said othing to Nelson, the co-pilot. I switched he ADF back to the "Compass" position when he had flown out our estimated time n route to Chanute. I asked him where he thought we were. He looked at the ompass needle which pointed straight ahead at a big, black-looking thunderhead and told me we were almost at our destin- ation. As he circled around the tip of the hunderhead, I had him watch the compass eedle. It did an about face, pointing to hat big, ugly cloud most of the time. Occasionally it would swing away around o the left for a minute, then back to the loud again. The cloud layer below us had ecome broken and then scattered, and looking down I spotted a huge body of water beneath us. We called Air Traffic Control on the radio and received permis- sion to descend and continue VFR (at that ime called CFR) to Chanute Field. Nel- on recognized Lake Michigan when we dropped below the cloud level, and he also ealized we had been blown many miles north of course. We decided to land at Chicago Municipal airport for gas and hanged our flight plan accordingly. Before we landed, however, I gave Nelson a horough work-out in taking aural nulls on the "Loop" position of the radio com- pass. He later checked out as first pilot on his own, and many of the men who rode with him told me that he was a stickler for using the loop to check ADF bearings.

Here are a few facts you should know about possible error in automatic compass bearings:

1. A tube in the receiver may fail and make the compass position of the receiver inaccurate. If the needle seems too steady or oscillates excessively, check compass bearings with an aural null. If they dis- agree, believe the null.

2. A thunderstorm will attract the com- pass needle. When in doubt, take an aural null on loop position. If they disagree, believe the null.

3. Bearings are usually more accurate on lower frequency stations. Therefore, a range station transmitting on 250 kilocycles will provide a more accurate bearing than a broadcast station on 1450 kilocycles. This is especially true at night. Check doubtful bearings with loop position.

4. All radio stations broadcast harmon- ics. This means that a range station trans- mitting on 355 kilocycles will also put out a signal on double that frequency or 710 kilocycles. If you were homing on radio station WOR (New York), 710 kilocycles, and passed close to a range station trans- mitting on 355 kilocycles, the radio compass could easily swing away from WOR and point to the range station. For- tunately, harmonics are only effective close to a transmitter. When in doubt, check and use aural null bearings.

5. Mountainous terrain, especially at night, can reflect radio signals, and give false ADF readings. Again I repeat, they won't affect an aural null.

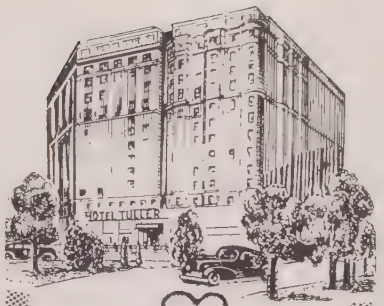
Many of you might ask what good is the ADF? Why don't you just buy a loop antenna and forget about an automatic direction finder? There's a simple answer to that—ADF is really a wonderful instru- ment. You can just sit there and let it do all your navigating for you. But the errors I have mentioned do occur now and then—fortunately, however, only on rare occasions. You may use the ADF for many years and never once experience any of the errors I have mentioned. Because they are possible, however, it would be a very good idea to know the procedures involved in shooting a loop bearing and taking an aural null. Here's how: (See loop sketch)

1. Identify the station on "Antenna."
2. Switch to "Loop" and, using the two-speed rotator, turn the loop until the signal disappears.
3. The indicator needle always points to the hole in the loop which is the null position (minimum signal). Switch "CW-Voice" to "CW" and increase the volume to narrow the null.
4. Locate approximate null position using high-speed rotation. Locate *exact* null using slow-speed rotation.
5. Watch indicator needle for bearing on azimuth scale showing null width. The minimum signal may cover only one or two degrees or as many as 30 degrees on the indicator dial. Once the two sides of the null are located (positions where signal is again audible) the center of the dead spot is the station bearing you're after.

The loop does, manually or mechanically, what the compass accomplishes automat- ically. There is one fact, though, that should be kept in mind when taking loop bearings. There are two aural nulls on every station exactly 180° apart. The ADF points only *to* a station, when functioning normally, but an aural null may lead to or away from the station. There are several ways of checking which of two aural nulls is the heading to the station. The compass position provides one quick check. Simply switch to the ADF compass position and the needle will point to one null or the other. With practice you will become quite proficient in taking bearings with both automatic compass and loop (aural null).

If you own a plane that will carry the extra weight of ADF, and if you're plan- ning extensive X-C's, look into this ADF business. Consult your local aircraft radio dealer for his advice before you buy. He'll help you choose the right ADF. That equip- ment will make relatively long-distance flying an easy pleasure—and fun.

Next month Ben Robin tells how to use your ADF.—Ed.



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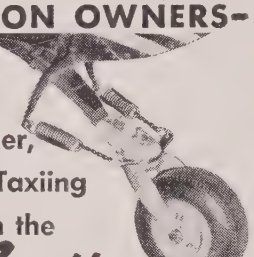

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Hot Pilot

(Continued from page 28)

Culver "V" that he owns now with two other Park Service men are both considered "hot" airplanes built primarily for the adventurous youngster.

"I don't use an airplane for sightseeing," says the director of the Southwest's two million-acre tourist attraction. "When I'm in the air, I'm always going somewhere—even if it's only the 59-mile hop to Trona for a haircut. The sooner I get there, the happier I am. That's why I always pour on as much throttle as the engine will take safely."

Largely through the Park Superintendent's efforts, Death Valley has one of the five airports located within the boundaries of a National Monument. The airport at Furnace Creek, 178 feet below sea level, has a 3400-foot main graveled runway. Tie-down, hangar and fuel are always available.

Flying in this desert resort area is restricted more often by high winds than by any other weather activity. Statistics show as many as 351 clear days a year and the annual rainfall in Death Valley averages less than one and one-half inches.

The rescue of a group of miners isolated by a snow storm, oddly enough, is one of the most graphic of Ted Goodwin's flying experiences in the Monument. With his Culver "V" in the shop for repairs on a wingspar that was cracked after mechanics dropped the plane off a pair of jacks while checking the landing gear, Mr. Goodwin borrowed a winter visitor's *Navion* to scout for the marooned miners following a freak snowstorm last January.

"I was worried about the miners in the mountains surrounding Death Valley," said the Park Superintendent. "Together with Frank Belcher of Menlo Park who owned the *Navion*, we started out to check on a group of miners reported to be snowbound in Race Track Valley, an isolated place 30 miles from the Ubehebe Crater. The mine owner, George Lippincott, had flown into the diggings just before the big 'blow-'n-snow' in his *Ercoupe*. We believed that both the owner and his mine crew had been snowed in for nearly three weeks and no one knew just how much food and fuel they had.

"We were forced to turn back on our first search attempt by fog and extreme icing conditions, in Death Valley of all places, and we waited on the ground for two days for better weather. In the meantime, the mine owner's wife confirmed the report that all the men were still at the isolated mine so I ordered a big bulldozer sent up 100 miles from the other end of the Valley to break through the 30 miles of snow, drifted in places to seven feet in height.

"Then we started out again by air to notify the miners that help was on the way. We made a small parachute and attached a note to it, then finally spotted the cabins barely sticking up through the snow. The eight men rushed out of the cabins, waving wildly. We stood the *Navion* up on a wingtip, slid back the hatch one notch and I fired the parachute clear of the radio antenna and the tail so that it dropped near the cabins.

"To cut a road through to the marooned men, it took 34 hours of ploughing in zero weather. Bulldozer operators could withstand the cold only for 15-minute shifts. But we got the men out safely. They had less than one day's supply of food and fuel oil remaining. The *Ercoupe* will probably be at Race Track Valley until the normally 'dry' lake dries up."

During the war, the peaceful skies over Death Valley were used for gunnery, navigation and bombing practice. It was fairly common to have student pilots, lost on cross-country trips, attempt landings on the deceptively soft salt surface of the desert dry lakes. A nose-over always resulted from a gear-down landing while a belly landing put the engine nacelles half way back through the wings as the soft, spongy ground caught the ships like a lecherous glue patch.

With a twinkle in his alert blue eyes, Ted Goodwin tells of a trip out to pick up the crew of an AT-11 (Twin-Beech.) "We received a long-distance phone call from the Air Force, telling us that one of their trainers was down with engine trouble at such-and-such a spot in the valley. They were positive of the location since six radio stations had shot a fix on the plane as it went down.

"We piled into a truck and headed down the valley. About five miles from the spot of the crash, we met a Sergeant plodding up the dusty road. He climbed aboard and we continued on toward the wreck.

" 'Something's wrong,' said the Sergeant, as we approached the AT-11 standing straight up on its nose in the salt flat. 'How did the rest of my crew pull the ship u that way? We landed on the belly an didn't nose over!'

"Just a couple of minutes later, w spotted the second AT-11. It seems tha the student pilot's Commanding Office had spotted the crash landing from th air and tried to land to investigate. Th Air Force took both trainers home on th same crash truck."

Ted Goodwin has many freak accident stories from this land of bleached bone and windblown sand dunes. His nomination for the luckiest airman over Death Valley was the gunner sitting in the top turret of a B-24 involved in a mid-air collision while practicing formation flying. The gunner was reading a funny book at the time of the crash and had no idea where he was, except "somewhere over North America."

Both gunner and turret were thrown clear of the jumbled wreckage at 20,000 feet and the gunner was able to open his chute at 5,000 feet. It was 105° in the shade when he landed so he threw his flying suit over his shoulder and started up the nearest road. Had he headed in the other direction he would have perished from the heat, but as it worked out, there was an on-leave SBD pilot visiting the valley. He recognized the plumes of black smoke from the wreckage, and a truck was dispatched to investigate.

With the wartime no-flying restriction extending out through Death Valley, Ted Goodwin and his son turned to building model airplanes. "We built about everything that was in the air in quarter-inch scale," he said. "Then we graduated to ¾ inch scale with wing spans up to six feet for a B-17. Every detail was correct inside and out. As soon as gas engines came back on the market, we graduated to the power jobs with control-line flying. I build them and the boy flies them. Now we have eight or nine true-scale jobs hanging up in the shop and several strung up around the house. Of course, there are others in various stages of repair."

Everyone flies in the Goodwin household. Son Ted Jr., at 18, has his private license and is headed for a career in the Air Force. Daughter Kay soloed on her 16th birthday at nearby Inyokern and is well on her way to a license. While she doesn't do much of the actual flying, Mrs. Goodwin accompanies her airborne family on many of their trips.

"With my children doing so much flying," says the Park Superintendent, "I decided that it would be cheaper and more convenient to have a ship of our own. My head mechanic, Leo Haley, was an ex-P-47 pilot and the Park Naturalist, Floyd Keller, held a private license. We decided to make a three-way deal on a plane.

"We picked up a little Culver *Cadet* and kept it all one summer at nearby Panamint Lake. This dry lake was big enough to handle a B-29 so we had no difficulty in getting off the ground even in temperatures over 115°. However, on some of the smaller fields, it was touch-and-go with two persons and a full load of gas. The engine was beginning to get 'tired,' and after almost not getting into the air at Barstow one hot afternoon, we decided to trade the little *Cadet* for a nearly new Culver 'V'

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This is an airman's gadget developed by the well-known meteorologist Dr. Irving Krick. It is based on principle that wind and cloud formations reveal coming weather changes, and it predicts whether it will be fair or stormy, windy, cloudy or sunny.

"Unless I could afford a *Bonanza* or a *Navion*, the Culver 'V' has everything I want in a little airplane," said Ted Goodwin. "It's true that the climb is slow, but with the two-position prop, we can get off quickly in hot weather and slam it in on short, rough fields on the tricycle gear. But, above all, the 'V' is fairly fast. That's the main reason I like it."

With surface transportation ranging from bad to worse off the main paved roads in Death Valley, it was only natural for Ted Goodwin to use an airplane. Aside from rescue work, the Park Superintendent's plane is used largely for road survey and maintenance work.

"Just after the big snow storm this January," said Ted Goodwin, "I got a call from the State Highway Patrol for a report on snow conditions over the mountains south of Death Valley and on to Trona. In an hour and a half in Frank Belcher's *Navion*, we covered all the roads in question and turned in a detailed report that could have been obtained in no other way."

Through a special arrangement with the National Park Service, Ted Goodwin is paid $7.50 per hour for flying on business.

Road construction and survey work were responsible for bringing Ted Goodwin to Death Valley in the first place. Just after the first World War, he was working as a civil engineer on the infant Yuma Irrigation project when Arizona and the other Western states finally decided to do something about getting a transcontinental highway across the sand dunes between Yuma and El Centro, California. Ted Goodwin did all the preliminary engineering on this famous highway.

Years later, Ted Goodwin developed a brand new kink by which dirt, gravel or crushed rock could be converted cheaply into oiled pavement. The National Park Service borrowed him from his Cadillac automobile agency in El Centro to show them how to build roads in Crater Lake and Yellowstone Parks. That road-building assignment eventually led to the Death Valley appointment.

When his service superintendent and a highway patrolman from El Centro bought a surplus *Jenny* 21 years ago, Ted Goodwin went along for the ride and learned to fly it. A dead engine and a forced landing astraddle an irrigation ditch, upside-down, put a temporary halt to his private flying. He was one of the best customers of the old Maddox Airline between Los Angeles, San Diego, El Centro and Phoenix. He rode the Ford Trimotors three times a week to Los Angeles and Phoenix to pick up new cars.

One of Ted Goodwin's best known flying friends is General "Hap" Arnold, former Air Force Chief. In the early days of the Death Valley Monument, 400 C.C.C. boys were assigned to the Furnace Creek camp. "Hap" Arnold, then a Lt. Colonel attached to March Field, was in charge of the "three C's" for the Southland.

Death Valley was just the right distance from March Field to give "Hap" Arnold's officers their monthly flight time, so the Furnace Creek Airport became a popular place and Ted Goodwin was able to fly in most of the military planes of that era. A flight in a Martin bomber, just back from an Alaska trip, clinched Ted Goodwin Jr. on an Air Force career.

There should be no SKYWAYS reader who would doubt that Ted Goodwin is a qualified expert on red hot weather flying. Here are his how-to-do-it hints for "civilized" pilots making their first flights across the sandy wilderness of the desert.

1. Always try to take off before 7 a. m. or after 5 p. m. to keep away from midday turbulence.

2. Stay away from the lee side of cliffs or mountains. Some of the downdrafts in this area go almost to the ground.

3. Watch for extremely sharp updrafts along "spurs;" rough ridges of earth that are formed along the sides of mountain ranges. Updrafts of 2,000 feet per minute are not uncommon.

4. Beware of dust devils when landing. They sign-post a small but violent low-pressure area that can scratch an airplane easily when it comes in at stalling speed close to the ground.

5. Be careful of high winds on landings. If the wind sock is standing straight out and there is sand blowing off the edges of the runway, circle the airport and wait until someone comes out to hold you on the ground once you land. Be sure and make a wheel landing! (It took six men to get a Stinson into the tie-down area at Furnace Creek during a recent 55-mph wind.)

6. Slow down in rough air — but don't get *too* slow. A plane will stall out very easily in turbulent air because of the violent changes in airspeed.

7. Don't start off across the desert with your gas or oil tanks half empty. It is easy to hit a wind shift and take much longer than you had planned to reach your destination.

8. Even if it takes a little longer, it's much safer to have a highway within gliding distance. The early Indians who lived near Death Valley didn't call it "Tomesha," (ground afire) for nothing.

9. There's no reason for getting lost while navigating across the broad expanse of the desert. Visibility is almost always up to 100 miles and tall mountains like 11,045-foot Telescope Peak overlooking Furnace Creek make the world's best landmarks.

10. Airway maps may show wonderful airports, but don't depend on getting gas there unless you're sure that the field is open. Many an airport like 6,000-foot CAA emergency field near Death Valley Scotty's, are completely abandoned. Check with an experienced local operator before starting out over unknown deserts.

11. And last, but by no means least, remember that any take-off run is longer on a hot day than on a cold one.

Ted Goodwin wiped the perspiration from his horn-rimmed glasses, squinted up toward the colorful peaks surrounding his Furnace Creek resort, and said, "Pilots are always welcome here. There is golf on an all-grass course, horseback, ground trips, swimming in a warm water pool—or just loafing around in the sun.

"As many as 65 planes have been in here at one time on weekend flights with the Aviation Country Club. Recently 40 ships flew in from Oregon and stayed five days. And we're only an hour and a half by *Bonanza* from Los Angeles. Drop in and see Death Valley sometime. Then you can be a red hot pilot, too!"

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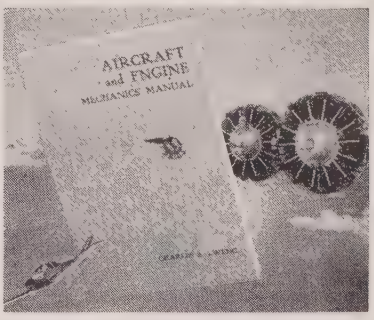

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Getting Off on Floats

(Continued from page 34)

except to increase the take-off run, whereas in glassy water an overloaded seaplane may require considerable jockeying to get it on the step or into the air. Under good conditions, however, it is just as easy to get a seaplane off as it is a landplane. In fact, with normal wind and water, many seaplanes may be safely taken off without touching the stick or wheel from the moment the throttle is opened. This is a trick that with the landplane would be hazardous to say the least.

In the air, few pilots would know from the feel of the ship whether it was equipped with floats or wheels or, for that matter, whether they were in a flying boat, a seaplane, or a landplane. The only difference that is likely to be noticed between wheels and floats is that the float-equipped ship is apt to require somewhat less aileron to maintain a steep sideslip.

In landing, the seaplane has all the advantage. A landplane must make contact with the ground in one position only—"three points"—or it is not considered a perfect landing. A seaplane or flying boat will make a good landing in any attitude—from one in which the nose is slightly above cruising position to full stall, providing the water is smooth. Landplanes must always be put down in a more or less restricted area. The seaplane, as a rule, has unlimited space, and spot landings are made by choice rather than necessity. In student work, the seaplane shows up better by comparison than anywhere else, since the biggest part of instruction is teaching the student to land. In practicing landings in a landplane, it is necessary to circle the field every time, so that 10 landings per hour is an excellent average. With the seaplane, the student flies downwind as far as desired and then turns into the wind and makes landings every few hundred yards on the way back, often averaging 30 or more per hour. By making his landings in such quick succession he is less likely to forget his errors. Furthermore, the practice work can usually be done in an area not congested by other airplanes or surrounded by obstructions. The landplane practice, on the other hand, must be done on an airport where other airplanes constitute a constant hazard to the student pilot and he to them.

The best conditions for take-off, and those which the beginner should always have, occur when there is a light breeze and clear water. The breeze should be enough to make slight waves but not enough to produce whitecaps. Naturally the plane should not be heavily loaded.

The ship should be taxied into position, the water rudders lifted, and a thorough scrutiny given the intended path of take-off, to make sure it is clear and there are no water craft heading across it. The ship is put on the step. The procedure employed in putting the ship on the step consists of holding the controls hard back and opening the throttle completely. The water rudders are lifted and the stick or wheel is held back until the nose refuses to go higher, and then is allowed to move forward to a point slightly back of neutral in some ships. In others, it is a help to push the control past neutral and then bring it slightly back. Anyway, as the plane rocks over on the step, it assumes an approximately level position and the speed increases rapidly. There is also a feeling of lightness which is soon recognized. As soon as the horizontal attitude has been reached, the throttle must be partly closed, otherwise the speed will increase until the ship takes off. Usually about 65 to 70 per cent of maximum rpm will keep the ship on the step without taking it into the air.

In this case, however, for taking off, the throttle is left open. As the speed increases (assuming the stabilizer is set for cruising), the slight back pressure maintained on the control column will keep the nose up, and the ship will fly itself off. And right here is where the average landplane pilot goes wrong. Since he is likely to be in the habit of pulling the landplane off, especially if there is ample power, he attempts the same thing with the seaplane before proper speed is attained. The result is that the stern of the float is pushed back into the water and the drag is thus increased tremendously; so instead of taking off, the ship slows down. Unless there is considerable excess horsepower, this procedure may result in preventing the ship from getting off at all.

The best angle for take-off is that in which the stern of the float is just clear of the water. A little practice will soon enable one to recognize the feel when the angle is too high and the tail is dragging. Only under one condition is it permissible to exceed the optimum angle and that will be described later. In regard to the "hands off" take-off previously mentioned, this may be accomplished by setting the stabilizer to trim the ship for the optimum angle, which usually is approximately the same as the setting for a steep climb or power-off glide. This type of take-off, however, is of no particular value, except as an indication of how the floats tend to assume the proper trim of their own accord—they are often better than the pilot! It is useful principally in demonstration work.

The experienced landplane pilot may find that on many ships the take-off run may be materially lessened by judicious use of the flaps, which can be operated quickly. The flaps are of little or no help in getting on the step, and indeed may actually prove detrimental because of the increased drag. But after the ship has attained fair speed on the step, they may be pulled abruptly part-way down and, by suddenly increasing the lift, will practically pick the ship out of the water. How far to pull them down and at what air speed depends on the particular airplane, which should be experimented with until the best combination is determined. After the ship is in the air, time should be allowed for the speed to increase before raising the flaps, and then they should be raised slowly or the plane may drop back into the water.

The take-off condition which requires perhaps more skill than any other, though in no way dangerous (except sometimes to the pilot's feelings), occurs on a hot, sultry day when the air is dead, the water glassy, and the ship overloaded. If in addition there is little reserve horsepower, the circumstances call for really expert technique. When the throttle is opened, the nose will rise as usual—or possibly the least bit less—and then it may stay there. In other words, the ship may not go on the step. Of course, any airplane may be loaded so heavily that no one can get it into the air, but if a take-off is possible it may be accomplished by the following procedure.

When the nose has risen as high as it will go with the controls hard back, push it down by abruptly moving the wheel or stick well forward. The nose will drop if the ship has picked up enough speed to be partly on the step, and then if the controls are held ahead, will come back up slightly, or rebound a little. This rebound should be caught by pulling the control column back again, and as soon as the nose has reached its maximum elevation the whole routine should be repeated. After several repetitions, it will be noticed that the nose goes higher each time and that the speed has increased. If the column is then pushed well ahead and held there, the ship will slowly flatten out on the step, and the controls may carefully be eased back to neutral. It is impossible in a written exposition to give the proper

Remember This . . . ?

Here's an old Ford Tri-motor, vintage 1926, and it's still doing a top job down South America way. This one shown here was rebuilt recently by Pacific Airmotive for the San Luis Mining Company. The mining company uses the plane to carry personnel and supplies between Mazatlan and the mine site. It's still called ". . . the best ship available for carrying heavy loads into tricky fields."

ming for rocking the ship onto the step
n this manner, and to become expert
equires considerable practice. The prac-
ce is well worth while, however, as it is
xtremely humiliating, not to mention poor
usiness, to have to go back to the shore
nd dump part of the load.

Even after getting on the step, the
rouble may not be entirely over, as a few
eaplanes and boats can be put on the
tep with more load than they will take
ff, unless another trick is used. If after a
easonable run, the ship shows no further
ncrease in speed and does not take off
n the normal manner under a slight back
ressure on the controls, the stick or wheel
hould be pulled back abruptly and the
lane practically yanked out of the water.
Extremely delicate handling is necessary
or the next few seconds, as the maneuver
onstitutes a stall take-off, and if the ship
: either leveled out too soon or pulled up
oo much, it will drop back into the water.

A more commonly used procedure for
ght aircraft is the one-float method which
nvolves lifting one float out of the water
s soon as possible to reduce the water
rag. It is accomplished after the plane
as almost gained take-off speed. At this
oint, full aileron is applied—normally to
he left, as the engine's torque will amplify
he aileron action in that direction. This
vill lift the right float out of the water
nd a marked acceleration in forward
peed will be noted as the drag of this
oat is eliminated. Shortly thereafter the
hip will fly off the water, or pulling back
harply on the stick will break the left
oat loose.

Whenever the water is glassy, the
hances of getting off without too much
ifficulty are improved if there are any
nall boats moving around, so that the
ake-off can be made across their wake,
rovided the ship is not too heavy. Some-
imes when all else fails it may be possible
o disturb the water enough by taxiing in
large circle and taking off across one's
wn wake.

If there is a heavy ground swell several
et high and little or no wind, the take-off
hould be made *parallel* to the swells,
referably along the crest, but by no
eans across them, regardless of the wind
irection. Striking one of these head on at
little less than flying speed may prove
isastrous.

If there is a strong current and *abso-
utely* no wind, the take-off will be easier if
nade with the current. However, if there
s enough wind to make the ship weather-
ock, a light current should be neglected
nd the take-off made into the wind.

There are times when circumstances
nake it necessary to take off in some
irection other than into the wind. In a
ght wind, the only particular caution to
e observed is to allow somewhat more
oom, especially if taking off with the
vind. In general, it is well to keep the
ose up a trifle more than in a normal
ake-off, and to allow the ship to pick up
lenty of speed instead of pulling it into
he air. As a matter of fact, if there is an
ff-shore breeze which is not too strong—
ay under 10 mph—the downwind take-off
considered by many to be safer than
axiing out and taking off toward the land,
ecause if there is any motor trouble on
he take-off, it is more desirable to have
water in front than land. It is definitely not advisable, however, to attempt to take off with the wind if its velocity is in excess of 15 mph.

Many pilots use the same procedure in the crosswind take-off as is followed with a landplane; namely, dropping the wing on the windward side, or holding the stick against the wind. In a very strong wind, it may be found that the ship heels over dangerously when the nose comes up prior to going on the step. Under such circumstances it is essential to put the ship on the step headed into the wind and then gradually turn more and more as flying speed is approached. Little if any space is lost by doing it this way, for if the wind is strong enough to turn the ship over, it is also strong enough to put it on the step very quickly. Furthermore, this is the only method possible, since to attempt to make the whole take-off directly across a wind of such velocity will result in a capsized airplane. By using the correct technique a seaplane of average size may be taken off in a cross wind of 40 mph without mishap.

Sometimes a pilot finds himself in a body of water which does not allow sufficient room for take-off. How he got there is unimportant. Possibly a forced landing, or perhaps the landing was made under one wind condition and the take-off must be made under another. A lake with an open approach from one side and high trees on the other might be responsible for the situation. This is where the step turn is an invaluable asset. The ship is put on the step downward, and then turned into the wind at the downwind end of the body of water. This permits the actual take-off to be made at the greatest possible distance from the windward shore. However, it should be borne in mind that such a procedure is quite dangerous, and the ship is likely to upset, particularly in a fair breeze, unless very expertly handled, If the ship is loaded so heavily that it will not go on the step downwind, it may be started planing into the wind and a complete circle made. Under this last condition, the pilot who was not extremely foolhardy would leave out part of his load.

Another important phase of seaplane flying might be "When Not To Take Off." One time is when a large boat has just passed and left heavy swells in its wake. It is perfectly possible to crack up by striking one of these. A few minutes of waiting for them to subside or to pass away from the take-off path may avert an accident.

Too much emphasis cannot be laid on the matter of being sure not only that the way *is* clear but that it will *remain* clear until the ship is in the air. Speedboats can come in from the most unexpected angles, and most of their drivers apparently credit airplanes with remarkable qualities, such as being able to stop within a few feet or take-off vertically. All water craft seem to assume that they have the right of way over an airplane, whether it is taxiing, taking off, landing, or merely sitting still. But whoever has the right of way, the airplane *is* likely to suffer most from a collision.

And as a final, and what should be (but unfortunately is not) an unnecessary caution: if in doubt—about anything—don't take off.

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(Continued from page 61)

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Used Planes

(Continued from page 48)

a good value for the priced asked?

Richard Sanders of Sanders Aviation, Inc., world-wide distributor for *Ercoupe,* while agreeing with the manufacturers on the necessity for a good used-plane base for new-plane sales, declares that dealers must eventually come around to placing some guarantee on the used planes they sell after having taken them as trade-ins. Many buyers fail to understand that a used plane which has been operated regularly will usually have an engine in better condition than the plane that has been sitting around for a couple of years, and that while its airframe is older in flight time it must have had the benefit of continual care. These intangibles have to be dealt with in some manner and if a dealer is willing to stand back of a bargain offering with some type of reasonable guarantee of service for a short period of time, he may convince an otherwise timorous buyer that he is really getting a worthwhile airplane. But until that world-shaking day arrives when a dealer can afford to warrant a used plane without becoming a sucker himself, the wary buyer must learn the ways of not getting stuck.

There are several cardinal rules of the game that every used-plane buyer should know for his own protection. He should read all the current ads for used planes listed in various aviation publications to get an idea of what a good average price standard might be. Even before looking at a plane a prospective owner must make up his mind as to just what type of plane he needs or wants and the high limit he's willing to go on price. When checking prices, he must also be careful not to confuse two-, three- or four-place planes made by the same or competing manufacturers. With these preliminary steps in mind and a little resolution against being high-pressured into a "bargain," it's safe to negotiate for a good used plane if a new plane is beyond the present pocketbook range.

The most important thing for a buyer to remember before closing a deal is to insure that his plane is exactly as represented by the seller. He can buy safely even without ever seeing the plane as long as a complete inspection is made by a reputable mechanic or operator who is willing to sign an inspection sheet certifying that the plane has been inspected and is in the condition and as complete as the seller says it is. The buyer cannot afford to neglect checking anything that concerns the mechanical status of the plane and that means at least the equivalent of a 100-hour check.

Whether buying from an advertisement, through a broker or in person, the buyer who wishes to make sure that no last-minute switches are made should have a pre-sale check list of all the equipment on the plane and should see the original log books on engine and aircraft to insure that the history of the plane is as advertised. On the legal side, to prevent future difficulties over ownership, as with any transfer of real property, he should ask for a guarantee of a clear title, which he may but shouldn't have to pay for himself. If a log book appears altered or incomplete in any way (in flight time or inspection periods and maintenance), the buyer must make sure that his own or his mechanic's pre-sale inspection is especially careful. If a plane has very little flight time during its calendar age, the engine should be checked carefully for possible corrosion and the after-effects of internal rusting.

The mechanic-representative or the buyer must check for compliance with all CAA directives and manufacturer's bulletins, since planes that have been idle for any length of time or have been maintained carelessly may be lacking important modifications. One vital consideration that many used-plane buyers overlook is the fact that while a plane may appear perfect in every way its flight performance may not be up to the manufacturer's minimums for the particular type, either because of sub-normal performance of its accessories or because it may be one of those inexplicable things that just won't fly right without expensive inspection-maintenance to find the hidden cause. A demonstration flight to satisfy this point should be a condition of sale after all other mechanical and legal conditions have been satisfied.

Information on the proper equipment for any aircraft, its performance characteristics and limits and required modifications may be found in the operations and maintenance manuals for the plane or may be secured from the manufacturer.

If a used-plane buyer approaches his "bargain" with as much care as the pre-war automobile buyer (a feat slowly becoming possible again) and refuses to be stampeded into buying a plane by the sight of an extraordinarily low price, he may really get a bargain without the quotes.

A satisfied used-plane buyer who paces himself in aviation according to the relative fatness of his wallet will eventually become one of those who want a new plane because it represents the latest and best on the market. He'll also appreciate that proper maintenance of his plane will give him a higher trade-in value when the time comes to get a newer model. +++

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Dilbert

(Continued from page 36)

would have thrown in the sponge and ne ahead with our one-wheel landing, cepting the inevitable groundloop and ng damage; but not Persevering Pete. At is point he obtained permission from e tower to make a landing approach and ounce the right wheel on the runway in further effort to jar the left landing gear to a down and locked position.

That's what he did, and it worked! He me in with considerable excess speed d with the right wing low. He bounced the right wheel fairly hard, then gave r the gun before losing flying speed and fore the left wheel touched down. He ecked his landing gear at 1,000 feet rough use of the indicators and warning rn, then made an uneventful, no-flap nding—nice as you please.

Within Gliding Distance—Case 1. A pilot as making an engine "run-in" flight at w altitude just off shore. When he duced the engine manifold pressure, mething went wrong, necessitating a rced water landing and a short swim.

Case 2. This pilot experienced engine ilure 15 miles from base during an gine test. By the time he checked the ntrols in an attempt to locate the uble, it was too late to jump. He was er rough terrain and was seriously jured in the ensuing forced landing.

There's an easy way to prevent washuts during tests of this nature. Simply *ay within gliding distance of the field.*

If you aren't interested in saving airlanes, think how lonesome you might ake your grandchildren.

Not Too Tight—Thirty minutes after takeff, the pilot of a large single-engine job oted a sudden drop in oil pressure. He mediately headed for the nearest emerency field, and almost made it, but close nly counts in dancing. When the engines oze, he was forced to land right now. o look at the scattered wreckage, you'd ever believe the pilot walked away.

Inspection of the engine later revealed hat the sump plug had been lost, which llowed the oil to drain out. When the ilot learned this, he swore that he would ound the responsible mechanic out of viation. Fortunately, that individual was ble to produce two witnesses who saw im safety wire the missing plug after the

ast oil change.

This testimony somewhat mollified the ilot's white heat, but still left him smolering; and with some justification. He gured the mech must have twisted the afety wire so tightly when he installed that it was practically severed, and soon parted due to engine vibration, allowing the plug to jiggle out.

His final remark should remind aviation maintenance and repair personnel to be meticulous in all their work. "I claim any mech who can't even properly install a safety wire is incompetent!"

Too Many Sniffs—One aviator recently had a close shave which should serve as a warning to all concerned. To relieve a mild nasal congestion while on X-C, he took four or five sniffs through a benzedrine inhaler every 15 minutes. An hour after take-off he had sensations of his hands and feet going to sleep. He opened the hood, thinking there was carbon monoxide in the cockpit. He also used the inhaler again, taking deep breaths in an effort to stimulate his senses, since he felt as though he were going to sleep.

His tongue soon felt thick and he noted his coordination was poor and that he was confused mentally. Finally, he lost all but a sort of gun-barrel type of central vision. At this point he seriously considered bailing out. He was near a large field, however, and by flying a loose formation on an accompanying plane, he was coached down to a fair landing.

After a sedative and a short sleep, his vision and sensations returned to normal. Except for the fact that he felt weak, he had no further difficulties. Let's look at the medical diagnosis of this case.

"It is known that benzedrine is a powerful stimulant of the central nervous system. It elevates blood pressure, stimulates the heart muscles, dilates the pupils, etc. It produces increased motor activity and sleeplessness.

"In some patients, who have above normal sensitivity to benzedrine, it produces headaches, palpitation, dizziness, delirium, fatigue and depression. The temporary mental stimulation obtained in normal persons is therefore not always salutary, and considerable danger lies in promiscuous use of the drug. Instructions coming with the benzedrine inhaler recommend inhaling twice through each nostril, not oftener than *once* an hour.

"Used in this manner as a means of preventing nasal congestion, the inhaler is perfectly safe; however, the above case

points out the danger of indiscriminate use of the benzedrine inhaler. All pilots should be warned of the inadvisability of attempting to use the benzedrine inhalers to relieve fatigue or sleepiness."

Nuff said.

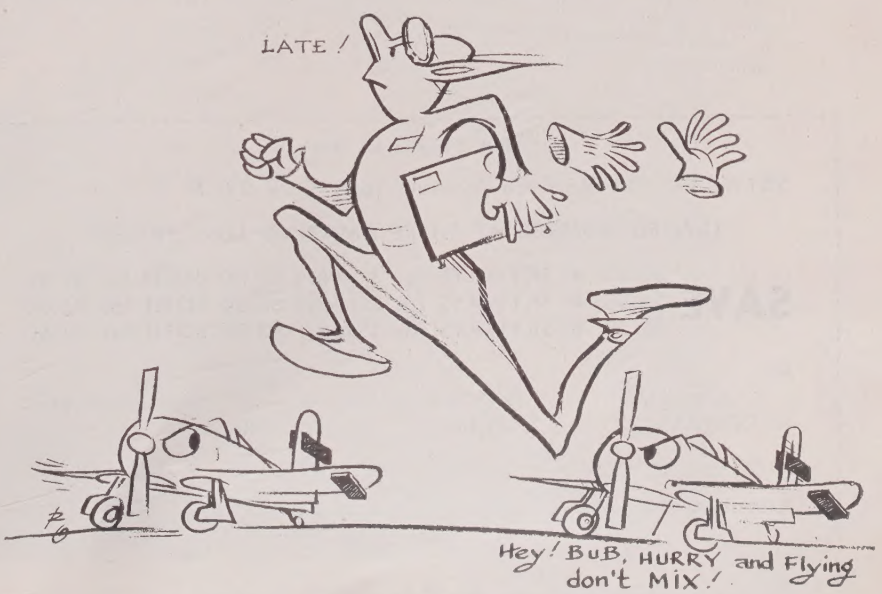
Poor Batten Average—Being late for his scheduled flight in advanced training, Dilbert decided to make up for lost time by skipping the preflight check.

Early in the take-off run, Dilbert noticed a strong wind to the left; however, being in a hurry, he paid no attention to it. He finally managed to get airborne, but by then the swing had become so strong that he found he couldn't control the plane.

He chopped the throttle and mushed in—about 50 yards to the left of the runway. The left wing was crumpled and the fuselage badly twisted.

Dilbert looked mighty foolish when they showed him that he had attempted to fly with a big rudder batten attached. The simplest preflight inspection would have caught this twice: first visually, and second when the controls were tested.

Dilbert argued that the mechanic in charge of the plane was to blame; he should have removed the batten. Of course, Dilbert knew that the mech's boner in this case didn't clear him. Dilbert actually vowed to himself he would never get double-crossed like this again. Everything he flew tomorrow, even the next day, would first be given a very thorough check.



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